Health Care Financing Grants & Contracts Report

A Prospective Reimbursement System Based on Patient Case-Mix for New Jersey Hosptials 1976-1981

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A PROSPECTIVE REIMBURSEMENT SYSTEM BASED ON PATIENT CASE-MIX FOR NEW JERSEY HOSPITALS 1976-1981

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A PROSPECTIVE REIMBURSEMENT SYSTEM FOR NEW JERSEY HOSPITALS

1978 MANUAL

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I. Introduction - Rates

The passage of S.446 presents all of us with an opportunity to resolve issues which have troubled the hospital community in this State for a decade. The law provides an explicit framework for developing and implementing standards concerning the payment for health care which insure fairness to the public and the institutions (See S.446, sections 2k, 2i, 5b, 11b.) by establishing a panel to be appointed by the Governor to consider the circumstances of individual hospitals (See S.446, section 5.), and a mechanism to apportion the hospitals' approved budgets equitably among payors. (See S.446, section 10b.) Assuming a reasonable degree of cooperation, the process also will be more timely and responsive. (See S.446, sections 11a and b.)

Although the particular form which S.446 takes results from the New Jersey experience dating back to the Wharton Report[1], the philosophy directs the state's health care community into the future. Thus, at different points the regulator is instructed to consider "the health care system as a whole," (See S.446, sections 18b and 11c.); those responsible for the hospitals are cautioned that financial solvency is to be equated with performance (See S.446, section 21.); and a new appeal section, which permits the separate consideration of issues which "may affect one or more hospitals," for the first time integrates physician decisions into the health care rate-setting process. (See S.446, section 11c.) In addition to providing a proper perspective on issues which transcend institutions, the law furnishes a basis for consistency between planning, licensing and payment.

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[1] T.G. Wharton, Report of Special Counsel to the Commissioner of Banking and Insurance of the State of New Jersey for the Public Interest, January 14, 1970.

The case-mix experiment in which the hospitals have been participating is only a preliminary methodological step in the development of the system which is required to reach the goals set for us by the legislature. Moreover, the system is still several months away from the first point in time at which certain hospitals may elect this option as a form of payment. Nevertheless, this Fall must be viewed as an important passage in the journey: S.446 is essentially a "blank slate" and this simulation will provide us with an opportunity to crystallize and solve problems, both practical and philosophical; to fill in the detail together and thus give life to the spirit of this legislation. Accordingly, presented herein is a description of progress to date together with issues on which we earnestly solicit your input.

The Seventh Quarter Report is divided into three major sections: Rates, Cost and Future developments. The section on Rates begins with a discussion of S.446 in order to place in perspective the sections which follow concerning rate design, simulation, standards and timetable. In addition to providing full documentation on the derivation of the rate from 1976 cost information, the section on Cost sets forth the steps of the case-mix model and illustrations on how to go through the allocation tables provided to your institution on August 21, 1978. The concluding section, Future Developments, provides some detail on anticipated improvements, such as reAUTOGRPing, which may affect the January rate.

A. S.446

The legislative standard which forms the basis for both the Preliminary Cost Base and Certified Revenue Base is that of a hospital which is:

> properly utilized and which delivers, effectively and efficiently, appropriate and necessary health care services of a high quality required by its mix of patients.

Although the Preliminary Cost Base initially may include costs in excess of this standard, the Certified Revenue Base, except as adjusted pursuant to regulation, may not. Thus, except for certain properly identified matters such as reasonable differences in levels and modes of medical practice, an institution must eventually operate at this level of efficiency mandated by the public before its Revenue Base can be certified by the Commission and financial solvency assured under the law. (See S.446, section 5b.)

The first task of the Commission is to establish a Preliminary Cost Base for each New Jersey hospital. Prior to assumption of jurisdiction, the legislature left to all of us the task of reaching agreements on financial elements, payor differentials and any remaining methodological questions. Pending resolution, all hospitals will be phased into the Commission's jurisdiction by January 1, 1983. (See S.446, section 5b.) The actual order of phase-in will turn on considerations such as indigency, federal sampling requirements outlined in the Sixth Quarter Report, and a balance between the relatively efficient and inefficient in order to protect the public interest. (See I.D., Standard, Timing, Goals p.64.) Although the time period specified provides for a gradual phase-in, the reader will undoubtedly realize that the reasonableness and good will

of every party will be required in order to resolve major issues, such as indigency, and thus permit the Commission to begin its work in 1979, as soon as prior year actual costs are available.

The concepts of preliminary cost and certified revenue form the framework for the methodology described within. The passage between these two poles is described in S.446 section 5b which states that:

> "The schedule of rates shall be reasonable and sufficient to provide the revenue requirements of the Preliminary Cost Base and shall be adjusted from time to time, as appropriate, to reach the Certified Revenue Base."

No time requirements were specified concerning the Certified Revenue Base out of respect for Judge Sidney Goldmann's admonition that hospitals will begin this passage from widely varying positions of efficiency.[2] Moreover, the flexible term "schedule of rates" was used so as to enable the rate design to treat each payor or class of payors (third party, self-pay) equitably, (See S.446, section 5b.) and to facilitate the adjustments called for under section 11.

Section 11 of the bill provides the tools by which to implement the concepts of Preliminary Cost Base and Certified Revenue Base. Section 11b specifies three classes of automatic periodic adjustments:

1. changes in economic factors reasonably calculated to provide for the effects of general economic inflation or deflation

2. industry wide changes in the efficiency of delivering health care services

3. each hospital's actual changes in volume and case-mix, which are necessary and appropriate

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[2] See Honorable Sidney Goldmann, Report of Hearings, (included in Appendix B-4 of the Third Quarter Report).

Although a more detailed discussion of the rate design required to implement this mandate follows, it is important to note here that the timeliness desired by all parties and specified in both sections 11a and 18d (Commission timeliness/penalties) depends directly on the timely and accurate submission of financial, statistical and patient information by all hospitals. One of the most important undertakings of this Fall should be a joint effort by all parties to streamline and unify this process so as to reduce regulatory lag and public expense and to promote financial certainty, cash flow, stability and convenience to hospitals.

As noted, section 11c provides the vehicle for addressing questions which "may affect one or more hospitals." Thus, when participating hospitals were visited during the Spring to discuss the first generation of management reports, medical staffs raised a variety of interesting questions concerning variations in medical treatment patterns. Under section 11c "the commission may sit en banc and hold public hearings in order to obtain the evidence required," to assess, for example, whether one hospital's apparently expensive stroke program has in fact reduced the total cost of treating DRG 144, Brain-Hemmorrhage (Stroke) without operation, and with a major secondary diagnosis, by reducing readmissions for therapy, or otherwise producing a significant patient benefit. (See pp. 183-200[3]) Based on advice from the medical community, PSROs, and individual physicians, a study might be undertaken and, depending on the results, a rate adjustment made to either the hospital's

[3] This example is offered by way of illustration only. Since this generation of management reports is based on 1976 data, the apparent problem may or may not have already resolved itself. Future management reports will be based on the most current data available.

Certified Revenue Base, the standard DRG rate, or a compromise adjustment where appropriate. (Similarly, the reimbursement aspect of other efforts currently being coordinated through DRGs, such as the quality parameters under development by the Commissioner's Physician Advisory Committee and the joint PSRO, HSA Department proposal under consideration by HCFA, could be considered under S.446, section 11c.) This represents an opportunity for the medical community to raise, discuss and to resolve wherever possible the twin issues of quality and cost which arise from their decisions. The public is served because "such adjustments shall take into account the effectiveness and efficiency of the health care delivery system as a whole." The health care community is served because considering such issues in this way will result in consistent planning, licensing and payment decisions which flow from a basis of consideration which is primarily medical.

It is important that sections 11b, 11c and 11d be read together. Section 11c provides the vehicle for crystallizing questions which transcend institutions and for dealing with them separately, out of the context of an individual hospital rate review. Similarly, section 11b, on automatic periodic adjustments, is designed to reach and then to preserve a reasonable Certified Revenue Base, based on standards of efficiency achieved by the industry, and to allow hospital administration to devote its full resources to the task which best serves the public, running the institutions. In both cases, the role of payment would shift from precipitating questions of efficiency and effectiveness to implementing, in a consistent fashion, the answers to these same questions as they are supplied by the providers. This change naturally

implies a shift in responsibility to the provider to manage budget dollars as the scarce resource that they are. The incentive for this shift is prospective payment based upon a methodology which gives fair recognition to the factors in the hospital environment which determine its ability to deliver health care efficiently and effectively. Such a system would tend to complement and reward the voluntary cost containment efforts currently underway in the hospital industry. In order to support this philosophy, rather than reimbursement maximization, section 11d provides that all other changes in the Commission's determination shall require a review by the Commission in a public hearing of the entire Preliminary Cost Base or Certified Rate Base and schedule of rates. "Further, in all appeals, the burden of proof shall be on the petitioner."

B. Rate Design

The purpose of rate design is to recognize both the goals which the public has established for the industry and the current positions of the individual institutions, to balance these, and to provide an effective mechanism which, over time, brings the two together. The goals which the public has established are embodied in the standard set forth in S.446 (p. 3). The mechanism is also suggested in S.446 (See pp. 1-8). The effort to recognize the different starting points of the various hospitals began with Judge Sidney Goldmann's ruling which emphasized the variable nature of productivity and directed us to rid the system of inefficiency over a reasonable length of time. Time phase adjustments which attempted to implement this ruling followed.

The experimental effort to recognize productivity began with the formation of DRGs, relatively homogeneous groups of patient cases. The groups provide the first measures of output appropriate to the hospital industry and, thus, a basis by which to discern the varying levels of efficiency which, according to Judge Goldmann, must be given consideration. Bearing in mind the various inaccuracies which have been extensively documented throughout these reports, the first crude "photograph" of the New Jersey health care industry emerged in the Spring of 1977 with the issuance of the statewide case-mix reports. A relative length of stay index was generated which compared the number of inpatient days consumed by each hospital in order to produce comparable results.[4] Case-mix management reports, based on cost rather than

[4]The index compares each hospital's patient days with the average number of days required to treat the same case-mix by all hospitals.

length of stay, were subsequently generated for eighteen hospitals participating in this Experiment in March of this year and furnished a more detailed portrait of each institution's relative strengths and weaknesses. However, the rate design required to properly balance the competing goals of the industry and the public, and to harmonize them over a reasonable length of time, required more development.

The original efforts to develop a fair rate design focused on the specification of a standard which would provide an appropriate goal for the industry. Thus, the mean cost per DRG which measures average cost performance within each hospital and might tend to legitimize embedded inefficiency, was rejected in favor of the median, which measures cost at the point at which 50% of the cases within a DRG are treated. Eventually a compromise was reached between the two.. (See Fifth Quarter Report). Having anchored the rate design at this standard, a system of suppliments and incentives was employed to adjust the rate so as to recognize the different initial starting points of the various institutions. As illustrated in example 1, p.10 , reproduced from the Sixth Quarter Report, the result of returning to the institution, by DRG, 100% of the difference for performance below the standard, and 70% of any overspending, was merely to reward the degree of divergence from the standard; the wider the swings, the more the reward.

EXAMPLE 1

ASSUME EACH HOSPITAL TREATS 10 PATIENTS IN EACH DRG

	COST DRG 1	COST DRG 2	TOTAL HOSPITAL COST
HOSPITAL 1	$ 600	$ 300	$ 9,000
HOSPITAL 2	$ 500	$ 400	$ 9,000
STANDARD RATE	$ 600	$ 300	

ORIGINAL METHOD FOR DETERMINING DRG PAYMENT

REIMBURSEMENT FOR HOSPITAL 1
$600 x 10 + $300 x 10 = $9,000

REIMBURSEMENT FOR HOSPITAL 2
$600 x 10 + ($300 + 0.7 x (400 - 300)) x 10 = $9,700

ALTERNATIVE METHOD FOR DETERMINING DRG PAYMENT

REIMBURSEMENT FOR HOSPITAL 1
(¼ x 600+3/4x600) x 10 + (¼ x 300 + 3/4 x 300) x 10 = $9,000

REIMBURSEMENT FOR HOSPITAL 2
(¼ x 600+3/4x500) x 10 + (¼ x 300 + 3/4 x 400) x 10 = $9,000

Following discussions with the industry, Blue Cross and the Department of Insurance, which are detailed in the Sixth Quarter Report, three major changes were decided upon: First, the arithmetic was changed so that the rate per DRG for each hospital would reflect symmetrical proportions of the standard and of its own cost. Composing the rate in this manner would tend to eliminate the problems of over-rewarding an institution simply because of its high efficiency in some areas and high inefficiency in others, while failing to reward the hospital operating consistently at the standard. It was also pointed out that the

public interest would not be served by simply rewarding past efficiencies but rather, by using incentives to encourage a new level of efficiency. The Department of Insurance suggested that this tension between incentive and reward might be resolved by initially balancing the rate to emphasize a higher proportion of the hospital's current actual experience rather than the standard. The proportions suggested as initial goals for the system, a rate initially composed of 25% standard/75% hospital costs,[5] would be shifted over time to emphasize the standard, as less efficient hospitals were supplied with management information and acted to cure operational difficiencies and to bring their expenditures into conformance with reasonable costs. However, the proportions would always sum to one in order to protect both the public and the hospitals by assuring that total expenditures stayed constant over a given rate period. Finally, it was suggested that the standard be raised to the mean to emphasize the incentive nature of the system and to encourage industry responsibility and initiative. It was felt that by providing a strong payment incentive and by linking it directly to operational efficiency, the focus of a considerable amount of industry energy and expense currently devoted to reimbursement maximization might be redirected and harnessed toward developing institutional efficiency and effectiveness, thus serving the rate paying public.

The complementary management information supplied by this system is outlined in section I.D. and detailed in Section V. It is earnestly hoped that this information will enhance and direct the current industry initiative toward voluntary cost containment by helping to suggest areas of investigation and by rewarding results. Establishing this standard

[5] In this form of notation, used throughout, the first percent figure refers to the proportion of standard, and the second percent figure refers to the proportion of individual hospital actual cost.

through this process implies that, over time, the industry will be developing its own measures of performance. Establishing the standard at the mean tends to reinforce this effect and implies a shift in responsibility between industry and regulator which is discussed under Standard, Timing, Goals section I.D. For purposes of this simulation, the mean has been selected as the standard. Accordingly, the schedule of rates which follows sets forth the standard rate per DRG in 1976 equalized dollars.

MAJOR DIAGNOSIS CATEGORY		DIAGNOSIS RELATED GROUPS	SCHEDULE OF RATES EQUALIZED 1976 STANDARD RATES
01: Infectious Diseases	001	Infectious Disease (Enteritis, Diarrhea) with Age less than 16	291.14
	002	Infectious Disease (Enteritis, Diarrhea) with Age greater than 15	476.10
	003	Infectious Disease (Viral Disease, VD, Meningitis) without Secondary Diagnosis	342.77
	004	Infectious Disease (Viral Disease, VD, Meningitis) with Secondary Diagnosis	501.83
	005	Infectious Disease (Blood Infection, TB, Salmonella) without Surgery	1,132.71
	006	Infectious Disease (Blood Infection, TB, Salmonella) with Surgery	1,727.32
02: Malignant Neoplasm of the Digestive System	007	Cancer of the Mouth, Tongue, Large Intestine, Liver, Gallbladder without Surgery	977.69
	008	Cancer of the GI System (Esophagus, Stomach, Pancreas, Small Intestine, Rectum) without Surgery	995.20
	009	Cancer of the GI System with Surgical Procedure (Biopsy, Endoscopy, Local Excision, Centesis) without Secondary Diagnosis	909.39
	010	Cancer of the GI System with Surgical Procedure (Biopsy, Endoscopy, Local Excision, Draining) with Secondary Diagnosis	1,608.84
	011	Cancer of the GI System with Surgery (Gastric Resection, Colon Resection, Esophagus Resection)	2,562.15
03: Malignant Neoplasm of the Respiratory System	012	Cancer of the Respiratory System (Trachea, Lung, Larynx, Thorax, Mediastinum) without Surgery without Secondary Diagnosis	725.02
	013	Cancer of the Respiratory System (Trachea, Lung, Larynx, Thorax, Mediastinum) without Surgery with Secondary Diagnosis	1,139.96
	014	Cancer of the Respiratory System with Surgical Procedure (Biopsy, Endoscopy, Excision of Lesion) without Secondary Diagnosis	833.49
	015	Cancer of the Respiratory System with Surgical Procedure (Biopsy, Endoscopy, Excision of Lesion) with Secondary Diagnosis	1,531.91
	016	Cancer of the Respiratory System with Surgery (Lobectomy, Laryngectomy, Radical Resection)	2,460.11
04: Malignant Neoplasm of the Skin	017	Cancer of the Skin except Malignant Melanoma without Secondary Diagnosis	400.11
	018	Cancer of the Skin except Malignant Melanoma with Secondary Diagnosis	711.47
	019	Cancer of the Skin - Malignant Melanoma with Surgical Procedure without Secondary Diagnosis	756.36
	020	Cancer of the Skin - Malignant Melanoma with Surgical Procedure with Secondary Diagnosis	975.41
05: Malignant Neoplasm of the Breast	021	Cancer of the Breast without Surgery with Age less than 63	904.93
	022	Cancer of the Breast without Surgery with Age greater than 62	947.78

		023	Cancer of the Breast with Surgery without Secondary Diagnosis	907.69
		024	Cancer of the Breast with Surgery with Secondary Diagnosis	1,219.83
06:	Malignant Neoplasm of the Female Reproductive System	025	Cancer of the Female Reproductive System (Uterus, Cervix, Vagina, Ovary, Fallopian Tube) without Surgery without Secondary Diagnosis	503.89
		026	Cancer of the Female Reproductive System (Uterus, Cervix, Vagina, Ovary, Fallopian Tube) without Surgery with Secondary Diagnosis	917.66
		027	Cancer of the Female Reproductive System with Surgical Procedure (D&C, Biopsy, Excision of Lesion) without Secondary Diagnosis	493.79
		028	Cancer of the Female Reproductive System with Surgical Procedure (D&C, Biopsy, Excision of Lesion) with Secondary Diagnosis	842.13
		029	Cancer of the Uterus Body with Surgery (Removal of Uterus)	1,136.92
		030	Cancer of the Uterus, Cervix, Ovary with Surgery (Removal of Uterus or other Major Operation)	2,029.16
07:	Malignant Neoplasm of the Male Reproductive System	031	Cancer of the Male Reproductive System (Penis, Prostate, Testicle) without Surgery	888.46
		032	Cancer of the Male Reproductive System with Surgical Procedure (Biopsy, Cystoscopy, Removal of Testicle) without Secondary Diagnosis	838.32
		033	Cancer of the Male Reproductive System with Surgical Procedure (Biopsy, Cystoscopy, Removal of Testicle) with Secondary Diagnosis	1,274.70
		034	Cancer of the Male Reproductive System with Surgery (Amputation of Penis, Removal of Prostate, Radical Excision of Lesion)	1,476.94
08:	Malignant Neoplasm of the Urinary System	035	Cancer of the Urinary System (Bladder, Urethra, Kidney, Ureter) without Surgery	867.99
		036	Cancer of the Urinary System with Surgical Procedure (Cystoscopy, TUR, Excision of Lesion) without Secondary Diagnosis	557.32
		037	Cancer of the Urinary System with Surgical Procedure (Cystoscopy, TUR, Excision of Lesion) with Secondary Diagnosis	995.41
		038	Cancer of the Urinary System with Surgery (Removal/Excision of Bladder, Kidney, Ureter, Urethra)	1,771.11
09:	Malignant Neoplasm of Other and Unspecified Sites	039	Cancer of the Bone, Thyroid, Connective Tissue, Nerves without Surgery	723.20
		040	Cancer of the Brain, Secondary Cancer, Multiple Cancer Sites without Surgery without Secondary Diagnosis	912.35
		041	Cancer of the Brain, Secondary Cancer, Multiple Cancer Sites without Surgery with Secondary Diagnosis	1,052.07
		042	Cancer of the Thyroid, Connective Tissue, Nerves with Surgical Procedure (Biopsy, Excision)	1,107.54
		043	Cancer of a Secondary Site, Multiple Sites with Surgical Procedure (Biopsy, Excision)	1,653.60
		044	Cancer of the Bone, Connective Tissue, Nerves, Secondary Site, Multiple Sites with Surgery	2,714.43

10:	Neoplasm of the Lymphatic and Hemopoietic Tissue	045	Tumor of the Lymphatic System, Blood Making Tissue without Secondary Diagnosis with Age less than 16	708.88
		046	Tumor of the Lymphatic System, Blood Making Tissue with Secondary Diagnosis with Age less than 16	808.27
		047	Disease of the Lymphatic System, Hodgkins Disease, Sarcoma without Surgery without Secondary Diagnosis with Age greater than 15	523.50
		048	Disease of the Lymphatic System, Hodgkins Disease, Sarcoma without Surgery with Secondary Diagnosis with Age greater than 15	1,072.69
		049	Tumor of the Lymphatic System, Multiple Myeloma, Leukemia without Surgery with Age greater than 15	1,463.15
		050	Tumor of the Lymphatic System, Blood Making Tissue with Surgical Procedure (Excision of Node) without Secondary Diagnosis with Age greater than 15	989.89
		051	Tumor of the Lymphatic System, Blood Making Tissue with Surgical Procedure (Excision of Node) with Secondary Diagnosis with Age greater than 15	1,965.72
		052	Tumor of the Lymphatic System, Blood Making Tissue with Surgery (Splenectomy, Radical Resection) with Age greater than 15	1,997.06
11:	Benign Neoplasm of the Female Reproductive System	053	Benign Tumor (Papilloma, Polyp) of the Uterus, Vagina, Vulva without Secondary Diagnosis	290.49
		054	Benign Tumor (Papilloma, Polyp) of the Uterus, Vagina, Vulva with Secondary Diagnosis	383.48
		055	Benign Tumor (Fibroma) of the Uterus, Ovary without Surgery	269.99
		056	Benign Tumor (Fibroma) of the Uterus, Ovary with Surgical Procedure (D&C, Excision of Lesion) without Second Surgery	358.66
		057	Benign Tumor (Fibroma) of the Uterus, Ovary with Second Surgery	462.47
		058	Benign Tumor (Fibroma) of the Uterus, Ovary with Surgery (Removal of Ovary)	714.30
		059	Benign Tumor (Fibroma) of the Uterus, Ovary with Surgery (Removal of Uterus)	890.03
12:	Benign Neoplasm of Other Sites	060	Benign Tumor of the Intestines, Urinary System, without Surgery	433.38
		061	Benign Tumor of the Brain, Pituitary Gland without Surgery	695.42
		062	Benign Tumor of the Skin, Bone, Urinary System (Kidney, Bladder), Connective Tissue with Surgery without Secondary Diagnosis	374.42
		063	Benign Tumor of the Skin, Bone, Urinary System (Kidney, Bladder), Connective Tissue with Surgery with Secondary Diagnosis with Age less than 43	499.79
		064	Benign Tumor of the Skin, Bone, Urinary System (Kidney, Bladder), Connective Tissue with Surgery with Secondary Diagnosis with Age greater than 42	626.39
		065	Benign Tumor of the Intestines, Nerves with Surgical Procedure (Excision, Other) without Secondary Diagnosis	511.92
		066	Benign Tumor of the Intestines, Nerves with Surgical Procedure (Excision, Other with Secondary Diagnosis	913.10

		067	Benign Tumor of the Intestines, Nerves with Surgery (Colon Resection Craniotomy Radical Resection, Other Major Operation)	1,589.28
		068	Benign Tumor of the Stomach, Brain, Respiratory System, Esophagus, Pituitary Gland with Surgery	2,065.94
13:	Diseases of Thyroid and Other Endocrine Glands	069	Disease of the Thyroid (Non-Toxic, Simple), Other Endocrine Glands (Adrenal, Pancreas without Surgery	605.87
		070	Disease of the Thyroid (Toxic), Low Function Pituitary without Surgery	705.58
		071	Endocrine Disorder with Surgical Procedure (Thyroidectomy, Other)	702.46
		072	Endocrine Disorder with Surgery	1,372.15
14:	Diabetes	073	Diabetes without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age less than 36	568.81
		074	Diabetes without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age greater than 35	690.41
		075	Diabetes without Surgery with Major Secondary Diagnosis	880.79
		076	Diabetes with Surgical Procedure (Endoscopy, Biopsy)	1,167.00
		077	Diabetes with Surgery (Amputation of Extremity, Other Major)	2,509.02
15:	Nutritional and Other Metabolic Diseases	078	Metabolic Disorder (Gout, Blood Globulin) without Secondary Diagnosis	567.68
		079	Metabolic Disorder (Gout, Blood Globulin) with Secondary Diagnosis (Nutrition Deficiency)	751.76
		080	Metabolic Disease (Cystic Fibrosis, Sprue, Unspecified)	995.15
		081	Metabolic Disease (Obesity, Malabsorption, Unspecified)	1,027.52
16:	Diseases of the Blood and Blood Forming Organs	082	Mediterranean Anemia, Hemophilia without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age less than 10	441.22
		083	Mediterranean Anemia, Hemophilia without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age greater than 10	661.84
		084	Disease of Blood Hemoglobin without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	699.21
		085	Disease of the Blood (Anemias), Blood Forming Organs (Spleen) without Surgery with Major Secondary Diagnosis	888.81
		086	Disease of the Blood (Anemias), Blood Forming Organs with Surgery with Age 2-52	1,023.50
		087	Disease of the Blood (Anemias), Blood Forming Organs with Surgery with Age less than 1 or greater than 53	1,538.97
17:	Psychoses Not Attributed to Physical Conditions	088	Schizophrenia (Paranoid, Catatonic, Unspecified) Involutional Melancholia with Psychiatric Service	857.29
		089	Schizophrenia (Paranoid, Catatonic, Unspecified) Involutional Melancholia without Psychiatric Service	718.41
		090	Schizophrenia (Affective, Acute Episode), Manic - Depressive Psychosis	1,033.71

18:	Neuroses	091	Neurosis (Anxiety, Hysterical, Phobic, Hypochondriacal Unspecified)	523.74
		092	Neurosis (Obsessive-Compulsive, Depressive), Personality Disorders	683.12
19:	Alcoholic Mental Disorder and Addiction	093	Alcoholism without Secondary Diagnosis or with Minor Secondary Diagnosis	542.26
		094	Alcoholism with Major Secondary Diagnosis (Liver Cirrhosis, Delirium Tremens, Other)	621.18
20:	Other Mental Disorders	095	Drug Dependence, Physical Disorder (Probably Psychiatric Origin), Cephalgia	556.69
		096	Psychosis, Non-Psychosis Related Brain Condition	1,084.58
21:	Diseases of the Central Nervous System	097	Epilepsy, Migraine, Brain Disorder (Unspecified) without Surgery without Secondary Diagnosis	427.59
		098	Epilepsy, Migraine, Brain Disorder (Unspecified) without Surgery with Secondary Diagnosis	700.85
		099	Multiple Sclerosis, Paralysis Agitans, Meningitis, Hemiplegia without Surgery	1,086.97
		100	Disease of the Central Nervous System with Surgical Procedure (Nerve Block, Other)	1,396.51
		101	Disease of the Central Nervous System with Surgery (Laminectomy, Spinal Fusion, Ventricular Shunt)	2,325.26
22:	Diseases of the Peripheral Nervous System	102	Facial Paralysis, Neuralgia (Trigeminal, Other Unspecified) without Surgery	606.50
		103	Sciatica, Polyneuritis without Surgery	730.32
		104	Disease of the Median Nerve with Surgery	416.92
		105	Disease of the Peripheral Nerves except Median with Surgical Procedure (Nerve Block, Other Unspecified)	555.28
		106	Disease of the Peripheral Nerves except Median with Surgery (Spinal Cord, Nerve Roots)	1,372.51
23:	Diseases of the Eye	107	Cross Eyedness, Cataract, Cyst of the Eyelid without Surgery	291.50
		108	Glaucoma, Corneal Inflammation/Ulceration, Disease of the Iris, Retina without Surgery	494.76
		109	Disease of the Eye with Surgical Procedure (Muscle Repair of Eyelid, Other)	307.68
		110	Disease of the Eye with Surgical Procedure (Removal of Lens, Incision into Sclera	500.77
		111	Disease of the Eye with Surgical Procedure (Reattachment of Retina, Repair of Cornea)	686.71
24:	Disease of the Ear and Mastoid Process	112	Disease of the Middle Ear (Inflammation, Chronic Mastoid Bone Inflammation) without Surgery	333.93

		113	Disease of the Inner Ear (Inflammation, Menieres Disease) without Surgery	505.05
		114	Disease of the Ear with Surgical Procedure (Incision of Membrane, Removal of Adenoids, Other)	195.56
		115	Disease of the Middle Ear with Surgery (Removal of Bone, Repair of Membrane)	402.84
		116	Disease of the Ear with Surgery (Removal of Mastoid Bone, Excision of Middle Ear, Other)	582.68
25:	Hypertensive Heart Diseases	117	Hypertensive Heart Disease without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	554.59
		118	Hypertensive Heart Disease without Surgery with Major Secondary Diagnosis	695.00
		119	Hypertensive Heart Disease (Fatal) with Kidney Involvement without Surgery with Major Secondary Diagnosis	975.41
		120	Hypertensive Heart Disease with Surgery	1,267.05
26:	Acute Myocardial Infarction	121	Disease of the Heart - Acute Myocardial Infarction	1,720.42
27:	Ischemic Heart Diseases Except AMI	122	Disease of the Heart, Ischemia (Blood Deficiency) except AMI without Surgery without Secondary Diagnosis	654.68
		123	Disease of the Heart, Ischemia (Blood Deficiency) except AMI without Surgery with Minor Secondary Diagnosis	815.17
		124	Disease of the Heart, Ischemia (Blood Deficiency) except AMI without Surgery with Major Secondary Diagnosis	1,010.79
		125	Disease of the Heart, Ischemia (Blood Deficiency) except AMI with Cardiac Catheterization	851.23
		126	Disease of the Heart, Ischemia (Blood Deficiency) except AMI with Surgical Procedure (Endoscopy, Insertion of Electronic Device)	1,735.72
		127	Disease of the Heart, Ischemia (Blood Deficiency) except AMI with Surgery (Shunt, Other Major)	3,545.82
28:	Arrythmia and Slowed Conduction	128	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	657.92
		129	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction without Surgery with Major Secondary Diagnosis	950.89
		130	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction with Replacement of Heart Device or Cardiac Catheterization	1,752.59
		131	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction with Insertion of Electronic Heart Device	2,573.31
29:	Heart Failure	132	Disease of the Heart, Failure (Poor Function) without Surgery	1,069.22
		133	Disease of the Heart, Failure (Poor Function) with Surgery	2,151.81

30:	Carditis, Valvular and Other Diseases	134	Disease of the Heart, Inflammation, Valve Problem without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	798.05
		135	Disease of the Heart, Inflammation, Valve Problem without Surgery with Major Secondary Diagnosis	1,111.40
		136	Disease of the Heart, Inflammation, Valve Problem with Cardiac Catheterization without Secondary Diagnosis or with Minor Secondary Diagnosis	907.46
		137	Disease of the Heart, Inflammation, Valve Problem with Cardiac Catheterization with Major Secondary Diagnosis	1,259.52
		138	Disease of the Heart, Inflammation, Valve Problem with Surgery (Valve Replacement, Other Major)	3,206.36
31:	Cerebrovascular Diseases	139	Circulatory Disorder of the Brain, Occasional Blood Deficiency without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	641.86
		140	Circulatory Disorder of the Brain, Occasional Blood Deficiency without Surgery with Major Secondary Diagnosis	801.92
		141	Blood Clot in Brain Obstructing Circulation without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	954.46
		142	Blood Clot in Brain Obstructing Circulation without Surgery with Major Secondary Diagnosis	1,200.03
		143	Brain Hemorrhage (Stroke) without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	1,272.75
		144	Brain Hemorrhage (Stroke) without Surgery with Major Secondary Diagnosis	1,775.31
		145	Circulatory Dysfunction in Brain with Surgery	2,574.88
32:	Diseases of the Vascular System	146	Disease of the Circulatory System, Inflammation of the Lymph Glands, Varicose Veins (Legs), Raynauds Disease without Surgery	412.35
		147	Disease of the Circulatory System (Hardening of Arterial Walls, Arterial Blood Clot) without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	769.63
		148	Disease of the Circulatory System (Hardening of Arterial Walls, Arterial Blood Clot) without Surgery with Major Secondary Diagnosis	964.61
		149	Disease of the Circulatory System with Surgical Procedure (Excision of Varicose Veins, Other) with Age less than 51	523.24
		150	Disease of Vascular System with Surgery (Excision of Varicose Veins, Other) with Age greater than 50	871.70
		151	Disease of Vascular System with Surgery (Excision of Nerve, Vessel) without Secondary Diagnosis	932.61
		152	Disease of Vascular System with Surgery (Excision of Nerve, Vessel) with Secondary Diagnosis	1,992.43
		153	Disease of Vascular System with Surgery (Arterial Reconstruction, Amputation of Extremity)	2,649.93

33:	Pulmonary Embolism	154	Blood Clot of the Lung without Secondary Diagnosis or with Minor Secondary Diagnosis	1,289.51
		155	Blood Clot of the Lung with Major Secondary Diagnosis	1,556.85
34:	Phlebitis and Thrombophlebitis	156	Inflammation of the Veins, Blood Clot without Secondary Diagnosis or with Minor Secondary Diagnosis	791.01
		157	Inflammation of the Veins, Blood Clot with Major Secondary Diagnosis	966.70
35:	Hemorrhoids	158	Hemorrhoids	477.70
36:	Hypertrophy of Tonsil and Adenoid	159	Enlargement of the Tonsils/Adenoids	235.97
37:	Acute Upper Respiratory Tract Infection and Influenza	160	Acute Upper Respiratory Tract Infection, Influenza with Age less than 45	354.31
		161	Acute Upper Respiratory Tract Infection, Influenza with Age greater than 44	729.20
38:	Other Diseases of the Upper Respiratory Tract	162	Disease of the Upper Respiratory Tract except Acute Upper Respiratory Infection and Influenza without Surgery	380.46
		163	Disease of the Upper Respiratory Tract with Surgical Procedure (Biopsy, Visualization of the Nasal Septum)	331.16
		164	Disease of the Upper Respiratory Tract with Surgery (Nose Reconstruction, Incision and Drainage of Sinus)	387.01
39:	Pneumonia	165	Pneumonia with Age less than 31	523.04
		166	Pneumonia without Surgery without Seconary Diagnosis with Age greater than 30	694.93
		167	Pneumonia without Surgery with Secondary Diagnosis with Age greater than 30	1,114.05
		168	Pneumonia with Surgery	2,131.80
40:	Bronchitis	169	Bronchitis with Age less than 46	427.98
		170	Bronchitis without Secondary Diagnosis or with Minor Secondary Diagnosis with Age greater than 45	636.32
		171	Bronchitis with Major Secondary Diagnosis with Age greater than 45	971.92
41:	Asthma	172	Asthma with Age less than 31	437.00
		173	Asthma without Secondary Diagnosis with Age greater than 30	648.31
		174	Asthma with Secondary Diagnosis with Age greater than 30	967.34
42:	Other Lung and Pleural Diseases	175	Lung Collapse, Pleurisy, Pulmonary Congestion without Surgery	796.61
		176	Emphysema, Embyema, Abscess, Acute Swelling without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	904.11

		177	Emphysema, Empyema, Abscess, Acute Swelling without Surgery with Major Secondary Diagnosis	1,192.34
		178	Disease of the Lung and Pleura with Surgical Procedure (Bronchoscopy, Chest Incision, Other) without Secondary Diagnosis	817.04
		179	Disease of the Lung and Pleura with Surgical Procedure (Bronchoscopy, Chest Incision, Other) with Secondary Diagnosis	1,663.67
		180	Disease of the Lung and Pleura with Surgery (Removal of Lobe, Other Major)	2,561.33
43:	Diseases of the Oral Cavity, Salivary Glands and Jaw	181	Minor Problems of the Teeth	234.48
		182	Major Problems of the Teeth (Jaw, Salivary Glands, Other Oral Soft Tissue)	382.47
44:	Gastric and Peptic Ulcer	183	Stomach Ulcer without Surgery without Secondary Diagnosis	525.73
		184	Stomach Ulcer without Surgery with Secondary Diagnosis	731.24
		185	Stomach Ulcer with Surgical Procedure (Biopsy, Visualization, Other)	967.03
		186	Stomach Ulcer with Surgery (Removal of Portion of Stomach, Other Major) without Secondary Diagnosis	1,460.77
		187	Stomach Ulcer with Surgery (Removal of Portion of Stomach, Other Major) with Secondary Diagnosis	2,262.21
45:	Upper Gastro-Intestinal Diseases except Gastric and Peptic Ulcer	188	Upper GI Disease Except Stomach Ulcer without Surgery without Secondary Diagnosis	346.42
		189	Upper GI Disease Except Stomach Ulcer without Surgery with Secondary Diagnosis	507.42
		190	Upper GI Disease Except Stomach Ulcer with Surgical Procedure (Visualization, Other Minor) without Secondary Diagnosis	462.02
		191	Upper GI Disease Except Stomach Ulcer with Surgical Procedure (Visualization, Other Minor) with Secondary Diagnosis	774.38
		192	Upper GI Disease Except Stomach Ulcer with Surgery	1,261.58
46:	Appendicitis	193	Appendicitis (without Peritonitis) without Secondary Diagnosis	487.81
		194	Appendicitis (without Peritonitis) with Secondary Diagnosis	764.83
		195	Appendicitis (with Peritonitis, Other) without Secondary Diagnosis	991.39
		196	Appendicitis (with Peritonitis, Other) with Secondary Diagnosis	1,621.01
47:	Hernia of the Abdominal Cavity	197	Abdominal Hernia with Age less than 15	290.02
		198	Inguinal Hernia (without Obstruction) with Age greater than 14 and less than 65 without Secondary Diagnosis	457.86
		199	Inguinal Hernia (without Obstruction) with Age greater than 14 and less than 65 with Secondary Diagnosis	573.57
		200	Abdominal Hernia Except Simple Inguinal with Age greater than 14 and less than 65 without Surgery	540.99

		201	Abdominal Hernia Except Simple Inguinal with Age greater than 14 and less than 65 with Minor Surgery	605.75
		202	Abdominal Hernia Except Simple Inguinal with Age greater than 14 and less than 65 with Major Surgery	907.33
		203	Abdominal Hernia with Age greater than 64 without Surgery	549.43
		204	Abdominal Hernia with Age greater than 64 with Minor Surgery	705.75
		205	Abdominal Hernia with Age greater than 64 with Major Surgery	1,231.50
48:	Enteritis, Diverticula, and Functional Disorders of the Intestine	206	Functional Disorder of the Intestine without Surgery	489.39
		207	Intestinal Pouching, Regional Enteritis, Ulcerative Colitis without Surgery	661.63
		208	Intestinal Pouching (Functional Disorder) with Minor Surgery without Secondary Diagnosis	567.48
		209	Intestinal Pouching (Functional Disorder) with Minor Surgery with Secondary Diagnosis	770.37
		210	Intestinal Pouching (Functional Disorder) with Major Surgery (Resection, Other)	1,855.98
49:	Diseases of the Anus	211	Disease of the Anus without Secondary Diagnosis	383.41
		212	Disease of the Anus with Secondary Diagnosis	466.45
50:	Miscellaneous Diseases of the Intestine and Peritoneum	213	Miscellaneous Disease of the Intestine and Abdominal Lining with Age less than 56 without Surgery	552.43
		214	Miscellaneous Disease of the Intestine and Abdominal Lining with Age greater than 55 without Surgery without Secondary Diagnosis	507.18
		215	Miscellaneous Disease of the Intestine and Abdominal Lining with Age greater than 55 without Surgery with Secondary Diagnosis	872.79
		216	Miscellaneous Disease of the Intestine and Abdominal Lining with Surgical Procedure (Local Incision, Excision)	545.02
		217	Miscellaneous Disease of the Intestine and Abdominal Lining with Visualization of the Intestine without Secondary Diagnosis	555.06
		218	Miscellaneous Disease of the Intestine and Abdominal Lining with Visualization of the Intestine with Secondary Diagnosis	1,056.17
		219	Miscellaneous Disease of the Intestine and Abdominal Lining with Major Surgery without Secondary Diagnosis	1,430.94
		220	Miscellaneous Disease of the Intestine and Abdominal Lining with Major Surgery with Secondary Diagnosis	2,511.08
51:	Diseases of the Liver	221	Hepatitis,(Infectious, Serum) Subacute Necrosis of the Liver with Age less than 41	781.60

		222	Hepatitis (Infectious, Serum) Subacute Necrosis of the Liver with Age greater than 40	1,101.12
		223	Liver Cirrhosis without Secondary Diagnosis or with Minor Secondary Diagnosis	1,084.58
		224	Liver Cirrhosis with Major Secondary Diagnosis	1,519.51
52:	Diseases of the Gall-Bladder and Bile Duct	225	Disease of the Gallbladder and Bile Duct without Surgery with Age less than 51	481.17
		226	Disease of the Gallbladder and Bile Duct without Surgery with Age greater than 50	686.83
		227	Disease of the Gallbladder and Bile Duct with Surgery without Secondary Diagnosis	891.61
		228	Disease of the Gallbladder and Bile Duct with Surgery with Secondary Diagnosis with Age less than 65	1,136.54
		229	Disease of the Gallbladder and Bile Duct with Surgery with Secondary Diagnosis with Age greater than 64	1,667.54
53:	Diseases of the Pancreas	230	Disease of the Pancreas without Surgery	820.05
		231	Disease of the Pancreas with Surgery	2,045.15
54:	Diseases of the Kidney and Ureter	232	Disease of the Kidney and Bladder without Surgery without Secondary Diagnosis	548.32
		233	Kidney Inflammation without Surgery with Secondary Diagnosis	677.53
		234	Nephrotic Syndrome, Nephritis (Chronic) Uremia without Surgery with Secondary Diagnosis with Age less than 65	1,018.56
		235	Nephrotic Syndrome, Nephritis (Chronic) Uremia without Surgery with Secondary Diagnosis with Age greater than 64	1,273.19
		236	Disease of the Ureter, Nephrotic Syndrome, with Surgical Procedure (Cystoscopy, Biopsy, Other Minor)	650.66
		237	Kidney Inflammation and Degenerative Disease (Including Kidney Pelvis) with Surgical Procedure	1,086.20
		238	Disease of the Kidney and Ureter with Surgery (Kidney Removal, Kidney Transplant, Other Major)	2,534.05
55:	Urinary Calculus	239	Urinary Stone without Surgery without Secondary Diagnosis	245.46
		240	Urinary Stone without Surgery with Secondary Diagnosis	389.49
		241	Urinary Stone with Surgical Procedure (Visualization, Catheter to Kidney Other)	617.09
		242	Urinary Stone with Surgery (Incision and Drainage of Kidney, Bladder, Ureter and Other Major)	1,221.90
56:	Cystitis and Other Urinary Diseases	243	Bladder Inflammation with Other Urinary Disease without Surgery without Secondary Diagnosis	401.81
		244	Inflammation of the Bladder and Urethra with Narrowing of the Urethra without Surgery with Secondary Diagnosis	493.54

	245	Bladder (Abnormal Passage, Pouching, Other Disease) without Surgery with Secondary Diagnosis with Age less than 46	457.74
	246	Bladder (Abnormal Passage, Pouching, Other Disease) without Surgery with Secondary Diagnosis with Age greater than 45	837.77
	247	Disease of the Bladder and Urethra with Surgical Procedure (Visualization, Opening	261.41
	248	Disease of the Bladder and Urethra with Surgical Procedure (Visualization, Excision, Dilatation, Repair) with Age less than 15	295.12
	249	Disease of the Bladder and Urethra with Surgical Procedure (Visualization, Excision, Dilatation, Repair) with Age greater than 14	499.55
	250	Disease of the Bladder and Urethra with Surgery (Removal of Bladder, Removal of Prostate, Other Major)	1,314.65
57: Disease of the Prostate	251	Disease of the Prostate without Surgery	508.18
	252	Disease of the Prostate with Surgical Procedure (Bladder Visualization, Dilatation of Urethra, Biopsy) without Secondary Diagnosis	364.81
	253	Disease of the Prostate with Surgical Procedure (Bladder Visualization, Dilatation of Urethra, Biopsy) with Secondary Diagnosis	534.25
	254	Disease of the Prostate with Surgery (Non-Incisional Removal of Prostate) without Secondary Diagnosis	782.22
	255	Disease of the Prostate with Surgery (Non-Incisional Removal of Prostate) with Secondary Diagnosis	1,151.99
	256	Disease of the Prostate with Surgery (Incisional Removal of the Prostate)	1,371.57
58: Disease of the Male Reproductive System	257	Excessive Foreskin over the Glans Penis with Surgery	289.77
	258	Disease of the Male Reproductive System Except Circumcision without Surgery	392.88
	259	Disease of the Male Reproductive System Except Circumcision with Surgery with Age less than 45	384.35
	260	Disease of the Male Reproductive System Except Circumcision with Surgery with Age greater than 44	538.33
59: Disease of the Female Reproductive System	261	Disorder of Menstruation without Surgery	249.72
	262	Disease of the Female Reproductive System Except Disorder of Menstruation without Secondary Diagnosis	393.11
	263	Disease of the Female Reproductive System Except Disorder of Menstruation with Secondary Diagnosis	452.89
	264	Disease of the Female Reproductive System with Surgical Procedures (D&C, Visualization, Removal Fallopian Tubes) without Secondary Diagnosis	279.04
	265	Disease of the Female Reproductive System with Surgical Procedure (D&C, Visualization, Other) with Secondary Diagnosis	352.50
	266	Disease of the Female Reproductive System with Surgery (Removal of Womb, Repair of Female Reproductive Organ, Other Major)	815.34

60:	Diseases of the Breast	267	Benign Breast Tumor, Chronic Cystic Disease without Secondary Diagnosis	311.88
		268	Acute Inflammation of the Breast, Enlarged Breast without Secondary Diagnosis	352.04
		269	Disease of the Breast with Secondary Diagnosis with Age less than 56	443.46
		270	Disease of the Breast with Secondary Diagnosis with Age greater than 55	487.85
61:	Abortion	271	Abortion without Secondary Diagnosis	237.48
		272	Abortion with Secondary Diagnosis	345.61
62:	Obstetrical Diseases of the Antepartum and Puerperium	273	False Labor without Surgery	78.80
		274	Threatened Abortion Premature Separation of the Afterbirth, Other Hemorrhage During Pregnancy without Surgery	243.63
		275	Obstetrical Complications, Poisons in Blood, Excessive Vomiting, Blood Clot Vein-Extremity without Surgery	349.18
		276	Obstetrical Disease Before and After Delivery with Surgical Procedure (D&C, Repair of Neck of Womb)	347.20
		277	Obstetrical Disease Before and After Delivery with Surgery (Removal of Tubes and Ovaries, Other Major)	598.11
63:	Normal Delivery	278	Delivery without Surgery or with Surgery Assisting Delivery	388.97
		279	Delivery with Tying of Tubes, Removal of Tubes	550.47
		280	Delivery with Cesarean Section	684.06
64:	Delivery with Complications	281	Delivery with Complications without Surgery or with Surgery Assisting Delivery	452.92
		282	Delivery with Complications with Cesarean Section	716.79
65:	Diseases of the Skin and Subcutaneous Tissue	283	Excessive Scar Tissue, Excessive Pigment, Fatty Cyst, Other Minor Skin Disease without Secondary Diagnosis	327.21
		284	Excessive Scar Tissue, Excessive Pigment, Fatty Cyst, Other Minor Skin Disease with Secondary Diagnosis	520.61
		285	Skin Inflammation, Abscess, Eczema, Chronic Ulcer without Surgery with Age less than 21	387.28
		286	Skin Inflammation, Abscess, Eczema, Chronic Ulcer without Surgery with Age greater than 20	663.76
		287	Skin Inflammation, Abscess, Eczema, Reddened Skin with Surgery without Secondary Diagnosis	576.37
		288	Skin Inflammation, Abscess, Eczema, Reddened Skin with Surgery with Secondary Diagnosis	1,349.65
		289	Psoriasis, Eruptive Skin Lesions, Chronic Skin Ulcer	1,201.55

66:	Arthritis	290	Arthritis without Surgery with Age less than 65	682.79
		291	Arthritis without Surgery with Age greater than 64	818.20
		292	Arthritis with Surgery (Excision of Bone, Joint, Membrane Surgical Joint Fixation)	905.98
		293	Arthritis with Surgery (Joint Incision, Spinal Fusions, Excision of Tissue Between Vertebrae)	1,183.39
		294	Arthritis with Surgery (Repair and Restoration of Joint, Removal of Membrane between Vertebrae)	2,198.97
67:	Derangement and Displacement of Intervertebral Disc	295	Disorder and Displacement of Disc Between Vertebrae without Surgery	688.73
		296	Disorder and Displacement of Disc Between Vertebrae with Surgery	1,531.37
68:	Diseases of the Bone and Cartilage	297	Rheumatism and Inflammation Tissue Covering Bone, Other Minor Bone Disease without Surgery	575.65
		298	Disease of the Bone, Inflammation of Marrow (Acute, Chronic), Spongy Bone, Unaided Fracture without Surgery	1,100.67
		299	Disease of the Bone, and Bone Tissue Lining, with Surgery (Excision Bone Lining, Repair of Other Joint)	650.55
		300	Disease of the Bone and Bone Tissue Lining with Surgery (Joint Incision, Bone Excision, Bone Fusion)	842.06
		301	Disease of the Bone and Bone Tissue Lining with Surgery (Amputation, Hip Restoration, Other Major)	1,722.95
69:	Other Disease of the Musculo-Skeletal System	302	Inflammation of the Component Parts of the Joints, Curvature of the Spine, Deformed Foot without Surgery	403.39
		303	Backache, Diffuse Disease of Connective Tissue, Inflammation of Muscle without Surgery without Secondary Diagnosis	630.32
		304	Backache, Diffuse Disease of Connective Tissue, Inflammation of Muscle without Surgery with Secondary Diagnosis	807.41
		305	Inflammation of the Component Parts of Joints with Deformity (Palm, Finger, Toe) with Surgery	424.07
		306	Other Disease of the Muscle and Bone (Major) with Surgical Procedure	510.14
		307	Other Disease of the Muscle and Bone (Major) with Surgery (Removal, Repair of the Small Joint, Bone)	691.24
		308	Other Disease of the Muscle and Bone (Major) with Surgery (Joining Vertebrae, Other)	1,595.85
70:	Congenital Anomalies	309	Birth Defect (Bone, Stomach, Testicle) without Surgery	361.56

		310	Birth Defect (Heart, Kidney, Other Major) without Surgery	587.36
		311	Birth Defect (Testicle, Skin, Stomach, Other Minor) with Surgery	467.41
		312	Birth Defect (Heart Valve, Other Unspecified Heart Site) with Surgical Procedure (Cardiac Catheterization)	505.82
		313	Birth Defect (Palate, Lip, Hip or Other Extremity) with Surgery (Repair of Mouth, Fixation of Hip)	575.37
		314	Birth Defect (Heart Valve, Other Unspecified Site) with Surgery (Heart Valve, Septal Repair)	1,596.45
		315	Congenital Diseases (Tetralogy of Fallot, Atrial Septal Defect, Hypospadia, Other) with Surgical Procedure (Catheterization, Repair of Urethra)	578.79
		316	Congenital Diseases (Tetralogy of Fallot, Atrial Septal Defect, Other) with Surgery (Valve, Septum, Shunt)	1,507.96
		317	Birth Defect (Spine, Gullet, Large Bowel) with Surgery	1,433.67
71:	Normal Mature Newborn	318	Normal Full Term Newborn	212.75
72:	Certain Diseases and Conditions Peculiar to Newborn Infants	319	Well Baby Care (Pregnancy greater than 9 months), Other Minor Disease or Condition of the Newborn Infant	450.43
		320	Immaturity, Hyaline Membrane Disease, Other Major Disease or Condition of the Infant without Secondary Diagnosis	477.17
		321	Immaturity, Hyaline Membrane Disease, Other Major Disease or Condition of the Infant with Secondary Diagnosis	1,107.25
73:	Signs and Symptoms Pertaining to the Nervous, Respiratory, and Circulatory Systems	322	Indications of Nervous, Respiratory, Circulatory System Disease without Surgery without Secondary Diagnosis	420.45
		323	Convulsions, Fainting, Nosebleed, Chest Pain without Surgery with Secondary Diagnosis	623.27
		324	Brain Disorder of Dizziness, Shortness of Breath, Coughing up Blood without Surgery with Secondary Diagnosis	736.24
		325	Indications of Nervous, Respiratory, Circulatory System Disease with Surgical Procedure	533.78
		326	Indications of Nervous, Respiratory, Circulatory System Disease with Major Surgery	1,370.99
74:	Signs and Symptoms Pertaining to the Gastro-Intestinal and Urinary Systems	327	Indications of Gastro-Intestinal, Urinary System Disease without Surgery without Secondary Diagnosis	290.36
		328	Indications of Gastro-Intestinal, Urinary System Disease without Surgery with Secondary Diagnosis	515.01
		329	Indications of Gastro-Intestinal, Urinary System Disease with Surgical Procedure (Visual Inspection, Other)	666.67
		330	Indications of Gastro-Intestinal, Urinary System Disease with Surgery (Abdominal, Other Major)	1,022.75

75:	Miscellaneous Signs, Symptoms, and Ill-Defined Conditions	331	Sterility (Male, Female), Admission for Observation without Surgery	232.62
		332	Chemical Imbalance, Headache, Fever, Other Ill-Defined Indication of Disease without Surgery with Age less than 15	369.98
		333	Chemical Imbalance, Headache, Fever, Other Ill-Defined Indication of Disease without Surgery with Age greater than 14	680.18
		334	Miscellaneous Indication of Disease with Surgical Procedure (Visual Inspection, Other)	412.11
		335	Miscellaneous Indication of Disease with Surgery (Abdominal Surgery, Removal of Uterus, Other Major)	1,202.61
76:	Fractures	336	Fracture (Skull, Face, Forearm, Leg, Foot, Hand) without Surgery with Age less than 30	332.71
		337	Fracture (Skull, Face, Forearm, Leg, Foot, Hand) without Surgery with Age greater than 29	748.40
		338	Fracture (Spine, Ribs, Bone of the Upper Arm) without Surgery with Age less than 65	656.84
		339	Fracture (Spine, Ribs, Bone of the Upper Arm) without Surgery with Age greater than 64	893.58
		340	Fracture (Thigh Bone, Pelvis, Multiple) without Surgery	1,055.47
		341	Fracture (Nose, Forearm, Hand, Lower Leg, Foot) with Surgical Procedure (Closed Reduction) without Secondary Diagnosis	288.25
		342	Fracture (Nose, Forearm, Hand, Lower Leg, Foot) with Surgical Procedure (Closed Reduction) with Secondary Diagnosis	432.23
		343	Fracture (Lower Jaw, Upper Arm, Ankle) with Surgical Procedure (Closed Reduction, Open Reduction of Face) without Secondary Diagnosis	459.51
		344	Fracture (Lower Jaw, Upper Arm, Ankle) with Surgical Procedure (Closed Reduction, Open Reduction of Face) with Secondary Diagnosis	735.04
		345	Fracture (Arm, Hand, Foot, Shoulder Blade) with Surgery (Open Reduction, External Fixation, Other)	537.30
		346	Fracture(Ankle, Leg Bones) with Surgery (Open Reduction, External Fixation, Other)	901.47
		347	Fracture (Thigh Bone, Pelvis) with Surgery (Open Reduction, External Fixation, Other)	1,852.32
		348	Fracture with Major Surgery (Amputation, Restoration of Hip Joint, Other Major)	1,830.74
77:	Dislocations and Other Musculo-Skeletal Injuries	349	Dislocation (Shoulder, Elbow, Wrist, Knee), Sprains (Ankle, Foot, Hand) without Surgery	372.76
		350	Dislocation (Jaw, Hip), Sprains (Knee, Scroiliac, Other Unspecified) without Surgery	593.07

		351	Dislocation (Shoulder, Elbow, Hand), Sprains (Elbow, Wrist, Hand) with Surgery	377.81
		352	Dislocation (Knee, Ankle), Sprains (Shoulder, Knee, Ankle) with Surgery	579.07
		353	Dislocation (Hip, Multiple), Sprains (Hip, Sacroiliac, Other Unspecified) with Surgery	977.69
78:	Internal Injuries of the Cranium, Chest, and Other Organs	354	Internal Injury of the Skull, Other Organ without Surgery without Secondary Diagnosis with Age less than 41	223.90
		355	Internal Injury of the Skull, Other Organ without Surgery with Secondary Diagnosis with Age less than 41	355.10
		356	Internal Injury of the Skull, Other Organ without Surgery with Age greater than 40	623.82
		357	Internal Injury with Surgical Procedure (Suture of Skin, Nerve, Nerve Repair, Other)	481.00
		358	Internal Injury with Surgery (Removal of Spleen, Drainage of Chest Cavity, Excision of Skin)	1,231.34
		359	Internal Injury with Surgery (Opening of Skull, Exploration of Abdominal Cavity)	2,581.09
79:	Open Wounds and Superficial Injuries	360	Open Wound (Uncomplicated), Superficial Injury, Foreign Body without Surgery	293.30
		361	Open Wound (Complicated), Bruise, Multiple Injuries without Surgery without Secondary Diagnosis	276.54
		362	Open Wound (Complicated), Bruise, Multiple Injuries without Surgery with Secondary Diagnosis	461.72
		363	Open Wound (External), Foreign Body with Surgical Procedure (Visualization, Suturing, Other)	346.09
		364	Open Wound (Complicated) of the Head, Multiple Sites with Surgical Procedure (Visualization, Suturing, Other)	499.35
		365	Open Wound (External), Superficial Injury with Surgery (Excision, Other Major)	547.05
		366	Open Wound (Complicated) of the Head, Multiple Sites with Surgery (Excision, Other Major)	1,016.64
80:	Burns	367	Burn of the 1st Degree (Uncomplicated) Covering less than 20% of the Body	572.13
		368	Burn of the 2nd Degree (Complicated), 3rd Degree Covering more than 20% of the Body	1,266.65
81:	Complications of Medical and Surgical Care	369	Complications of Medical or Surgical Care without Surgery without Secondary Diagnosis	411.99
		370	Complications of Medical or Surgical Care without Surgery with Secondary Diagnosis	696.83
		371	Complications of Medical or Surgical Care with Surgical Procedure	500.90
		372	Complications of Medical or Surgical Care with Surgery (Replacement of Heart Device, Repair of Stomach)	1,257.12
		373	Complications of Medical or Surgical Care with Surgery (Revision of Shunt, Other Major)	1,533.60

82:	Adverse Effects of Certain Substances	374	Adverse Effect of a Drug, Toxic Effect of Alcohol without Secondary Diagnosis	255.32
		375	Adverse Effect of a Drug, Toxic Effect of Alcohol with Secondary Diagnosis	526.95
		376	Toxic Effect (Lead, Acid, Alkali, Carbon Monoxide, Radiation) without Secondary Diagnosis	415.53
		377	Toxic Effect (Lead, Acid, Alkali, Carbon Monoxide, Radiation) with Secondary Diagnosis	994.12
83:	Special Admissions and Examinations without Reported Diagnoses	378	Prenatal Care, Medical and Surgical after Care (Dialysis) without Surgery	142.40
		379	Admission for Sterilization, Chemotherapy, Radiation Therapy without Surgery	344.03
		380	Follow up (Cancer) Surgery, Medical after Care (Colostomy, Orthopedic, Other) without Surgery	537.54
		381	Special Admission with Surgery (Sterilization, D&C, Other)	273.51
		382	Special Admission with Surgical Procedure (Bladder Visualization, Removal of Fixed Internal Device)	361.96
		383	Special Admission with Surgery (Exploration of Abdominal Cavity, Removal of Uterus, Other Major)	940.12
84:	Outliers	384	Outlier Group 1	1,156.00
		385	Outlier Group 2	1,837.38
		386	Outlier Group 3	2,621.90
		387	Outlier Group 4	3,284.96
		388	Outlier Group 5	4,266.94
		389	Outlier Group 6	5,618.83
		390	Outlier Group 7	5,431.51
		391	Outlier Group 8	6,345.24
		392	Outlier Group 9	8,484.61
		393	Outlier Group 10	9,331.62

The rate simulation which follows builds upon the arithmetic (% standard/% hospital cost), the proportions (25% standard/ 75% hospital cost) and the standard (the mean). More particularly, subsequent thinking has not altered the suggestion of the Department of Insurance that the proportion, one quarter standard and three quarters hospital current cost, is an appropriate starting point for the system. In order to provide perspective concerning this proportion, four basic ranges of proportions were considered. The proportion which theoretically best meets the basic standard set forth by the public in S.446, "a hospital which is properly utilized and which delivers, effectively and efficiently, appropriate and necessary health care services of a high quality required by its mix of patients," would, of course, be a rate composed entirely of the standard. However, current average hospital performance includes inefficiencies caused in part by more than a decade of cost-based reimbursement and by per diems, the unit of payment which encourages excessive lengths of stay. Moreover, there is a segment of hospitals not currently operating at or below the standard. These hospitals might be seriously harmed by these proportions of 100% standard/0% hospital. This would run contrary to the spirit of Judge Goldmann's "time phase" principle which has been covered into sections 2k and 5b of S.446. (See discussion, section I.D., Standard, Timing, Goals.) Most of all, it is unlikely that physicians could agree on a uniform approach and expected outcome, and thus a standard, for all DRGs. The very purpose of S.446, section 11c, which permits us to consider issues which "may affect one or more hospitals," is to better understand the dividing line between the art and the science of medicine. (See discussion p. 5,6 .)

Similarly inequitable would be the opposite proportion, 0% standard/ 100% hospital cost, which would merely return to the institutions what they are currently spending. In addition to totally disregarding the standard expressed in the law (section 2k and 1), it would do violence to the public policy of the State as expressed in section 1 which maintains, among other things, that the parties shall "contain the rising cost of health care services." It would also ignore years of case law involving regulated industries which holds, rather consistently, that the public is not obliged to subsidize inefficiency. Moreover, it would eliminate any reward whatsoever for current efficiency.

A study was performed to measure the degree of confidence implied in the price per case across hospitals.[6] Comparing the average cost per DRG by hospital suggested a third range of proportions which might be set at 68% standard/32% hospital cost. Varying the amount of standard by the level of confidence within each DRG across institutions produced swings that were too eccentric. Hospital costs ranged from 11.3% of their estimated patient care costs to 89%. The amounts involve total patient care dollars only and the term "Estimate," used as a basis of comparison throughout, refers to the actual costs of each institution in 1976, inflated twice (See Economic Factor p. 161-162).

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[6] A coefficient of variation was calculated using each hospital's average cost per patient for each DRG across hospitals in order to measure confidence in the rates for payment purposes. The coefficient of variation is the standard deviation divided by the mean and in this case, indicates how closely grouped the individual hospital costs are around the mean cost per patient. When this coefficient of variation becomes the hospitals' proportion in the rate and is applied across the actual case-mixes of the hospitals, it produced a rate for patient care services composed on the average of 68.07% standard/31.93% hospital costs.

Two basic reasons are persuasive that this is an inappropriate starting point despite the level of confidence indicated by the study: First, obvious imperfections in the inputs and methodology raise caution concerning a rate blend which would redistribute such substantial amounts of dollars. Recent studies indicate a level of error in abstract coding which is not insignificant. Although there is no way to accurately isolate the actual payment effect (a miscoded diagnosis is not discarded from the system, but merely shifted between DRGs), or to estimate how many errors would be caught by the system (a coded diagnosis which is less severe than the diagnosis which accounted for the major resource consumption might be captured as an outlier.), it is clear that some mis-distribution would occur. It is expected that in 1979, the first year during which this information will actually be used for payment purposes, the quality of the reporting will increase substantially. Payment during the rate period is made on the basis of actual case-mix. Moreover, we are taking active steps in terms of educational programs and the users manual (See section I.E. timetable.) to remedy the problem. However, our projections, which until mid year 1979 will span two years, are grounded in 1976 and 1977 data.

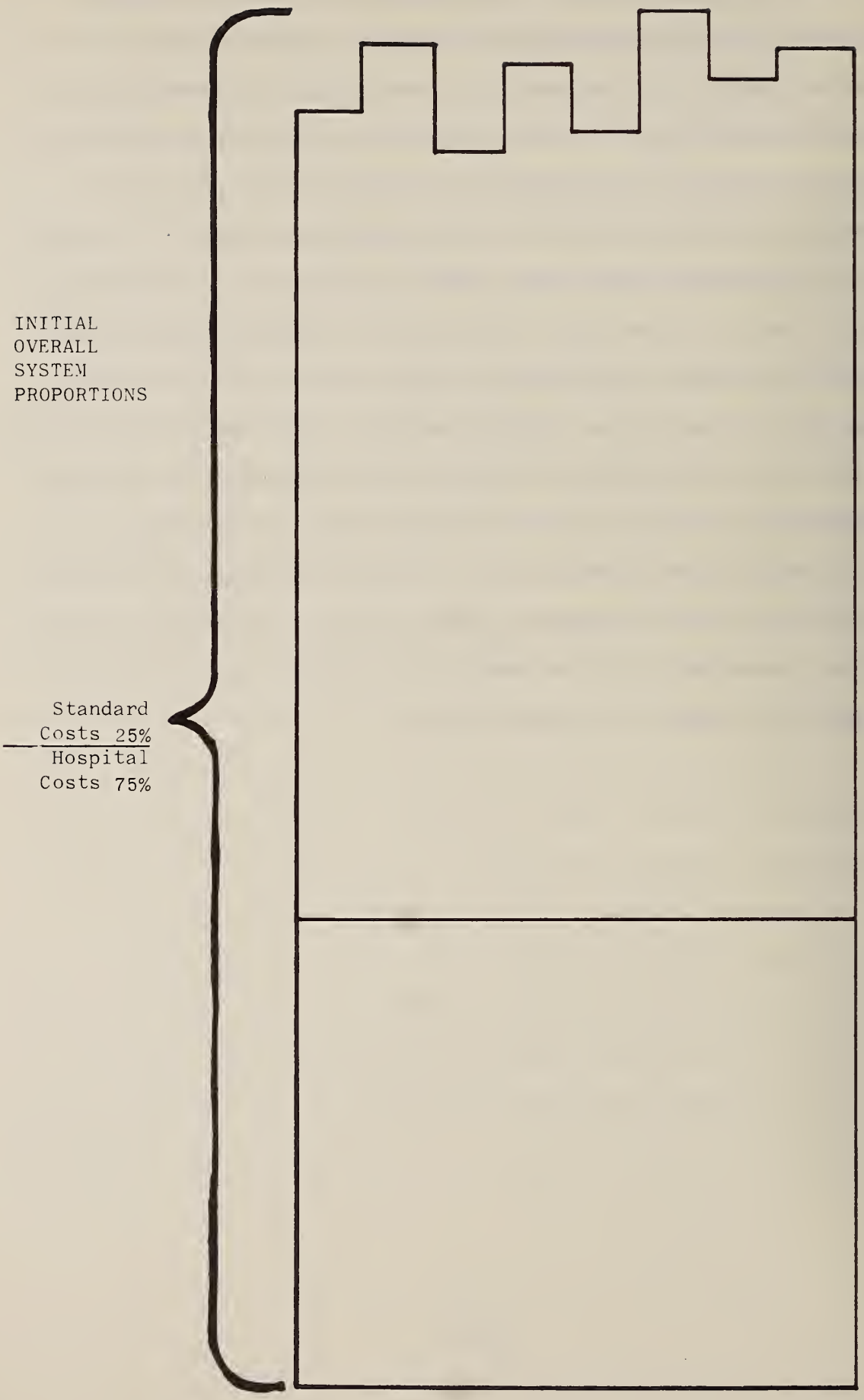
Other imperfections also dictate caution. Thus, for example, the failure to adequately compensate for transfer patterns could result in over-payment to the transferring hospital, as well as under payment to the referral center. Failure to give recognition to an appropriate amount of teaching cost which might be incurred in the

patient care services could also do injustice; however, while a reasonable amount of such costs are to be anticipated, passing through all such costs could result in encouraging poor habits, including a lack of cost-consciousness among physicians in training, which would eventually harm the public. Thus, a delicate balance must be struck. Also, the current set of nursing weights, generated by industry nursing representatives through a process known as Q-sort, are overly-subjective. (See Sixth Quarter Report.)

The activities outlined in the section on Future Developments, such as the reAUTOGRPing effort currently underway or the program to develop more refined nursing weights, represent the State's commitment to continually improve the system, to keep it current and to help it evolve. These activities should reduce the variation between hospitals (68% standard/32% hopsital) even more prior to January and into the future. However, this range of proportions, perhaps 75% standard/25% hospital cost, begins to suggest both the goal and the limits of affirmative action in efficiency increases which can be taken by hospital and medical administration alone. Beyond this range, it becomes increasingly important to harmonize the goals of licensing and planning to integrate them consistently into the system of payment. Moreover, the results of the reAUTOGRPing will help to uncover areas where physician practice patterns diverge. Thus, this range of proportions also tends to suggest the importance of the dialogue with the medical community which can be joined through section 11b (See further discussion in Standards, Goals and Timing.)

The second basic reason for treating 75% standard/25% hospital cost as a goal, and 25% standard/75% hospital cost as an initial starting point, is the suggestion in S.446, section 2k, which permits that: "The preliminary cost base initially may include costs identified... as being in excess of the proportion of a hospital's current costs identified (by the standard p.3), which excess costs shall be eliminated in a timely and reasonable manner prior to certification of the revenue base." Section 5b adds that, "The schedule of rates...shall be adjusted from time to time, as appropriate, to reach the certified revenue base." Thus, it would appear that original proportion suggested by the Department of Insurance, 25% standard/75% hospital costs, does represent the range within which all parties can initially accomodate the various goals of S.446, Judge Goldmann's admonitions concerning time phase and variable productivity, and the immediate interests of both the industry and the public. Accordingly, for purposes of the simulation, we have used this proportion to establish the rate design.

FIGURE 1


INITIAL
OVERALL
SYSTEM
PROPORTIONS
Standard
Costs 25%
Hospital
Costs 75%

C.1. The Simulation: Patient Care Costs

Although the standard (the mean) the arithmetic, and the proportions 25% standard/75% hospital costs have all been preserved, it was considered important to given recognition to one additional factor in developing the rate: the homogeneity of the DRGs themselves. There has been considerable constructive criticism from the participating hospitals, the medical community and various other parties concerning the quality of certain DRGs. This concern led to the examination of the degree of variation within a DRG across hospitals (discussed previously at p 32) as well as the degree of variation within a DRG across patients. Since the purpose of working with DRGs is to develop a system of units or common denominators which transcend individual institutions, a coefficient of variation was calculated for each DRG in order to measure confidence in its predictive ability. The measure is arrived at by dividing the standard deviation of patient costs for each DRG by mean cost, and indicates how closely grouped the individual patient cases are around the average cost. Histogram 1 displays this information for all DRGs across patients: the lower the coefficient, the higher the level of confidence indicated.

In order to ensure that no part of the system exceeds its own limitations, the actual proportion of patient care standard, as opposed to patient care hospital cost, which is blended into a given DRG rate varies directly with the quality of the definition of that DRG i.e., the coefficient of variation for the DRG becomes the hospital proportion.[7] Thus, if the coefficient of variation of DRG x is .6, the hospital's actual cost is $250, and the standard is $300, the rate would be composed of 60% of $250, plus 40% of $300, or $270

[7] See above page 32, footnote 6.

HISTOGRAM 1

Distribution of DRGs by Coefficient of Variation across Patients

VALUE	FREQUENCY	PERCENT	CUMULATIVE	
.				
.15	1	.3%	.3%	
.2	3	.8%	1.0%	*
.25	3	.8%	1.8%	*
.3	13	3.3%	5.1%	******
.35	8	2.0%	7.1%	****
.4	17	4.3%	11.5%	********
.45	29	7.4%	18.8%	**************
.5	36	9.2%	28.0%	******************
.55	48	12.2%	40.2%	************************
.6	39	9.9%	50.1%	*******************
.65	39	9.9%	60.1%	*******************
.7	31	7.9%	67.9%	***************
.75	42	10.7%	78.6%	*********************
.8	32	8.1%	86.8%	****************
.85	22	5.6%	92.4%	**********
.9	9	2.3%	94.7%	****
.95	7	1.8%	96.4%	***
1	5	1.3%	97.7%	**
1.05	2	.5%	98.2%	*
1.1	3	.8%	99.0%	*
1.15	1	.3%	99.2%	
1.2	0	.0%	99.2%	
1.25	1	.3%	99.5%	
1.3	1	.3%	99.7%	
1.35	1	.3%	100.0%	

The column marked "value" indicates the coefficient of variation. The lower the coefficient, the higher the level of confidence in its predictive ability. "Frequency" indicates the number of DRGs at each coefficient of variation. "Percent" indicates the proportionate number of DRGs at each level and "Cumulative" sums the proportinate number of DRGs accounted for at that level.

On the other hand, if the coefficient for DRG x was .4, which would indicate relatively more confidence, then the rate would be composed of 40% hospital cost and 60% standard, or $280. The schedule of rates which follows is the actual DRG rate list, simulated in 1978 unequalized dollars, for hospital F one of the eighteen participating hospitals; (see section IV.A. and B.), it incorporates this computation. While the payment rates are calculated in the same manner for all hospitals, the inputs into the calculation, namely each hospital's actual DRG unit costs, may differ. This results in a unique set of DRG rates for each hospital which recognizes its own current level of productivity.[8]

A relatively high degree of confidence in a given DRG tends to indicate that the grouping has accurately captured an underlying pattern of medical practice which transcends institutions. Thus, an individual institution is given extra information on how to interpret its management reports and the likely need to take steps internally to cure a deficiency. A lesser degree of confidence may represent a signal to the State to refine the classification, perhaps through reAUTOGRPing, seeking clarity in terminology, or consistency in reporting; or a signal to the medical community to clarify the diversity of practice, discuss its implications and make payment recommendations. Under these circumstances, the institutions are protected by the rate which reflects a proportionately larger share of their own costs of treating the particular group, while the exploration goes forward. Thus, by permitting the patient care portion of the system to float to its natural level based on degree of confidence, the DRGs anchor themselves and provide the appropriate incentive to each party to act responsibly.

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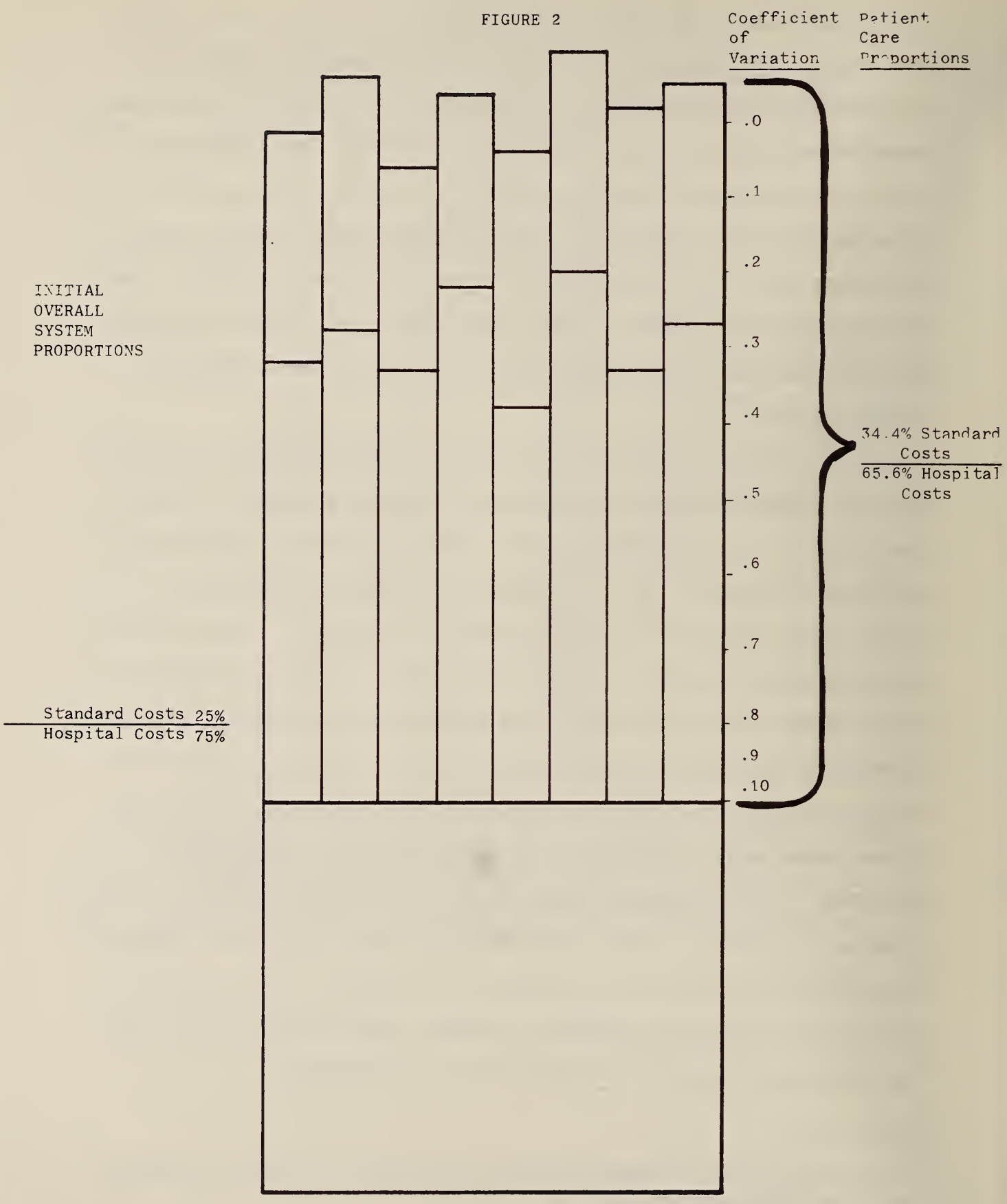
[8] See Honorable Sidney Goldmann, Report of the Hearer (included in Appendix B-4 of the Third Quarter Report.)

FIGURE 2


Coefficient of Variation
Patient Care Proportions
.0
.1
.2
.3
.4
.5
.6
.7
.8
.9
.10
INITIAL OVERALL SYSTEM PROPORTIONS
Standard Costs 25%
Hospital Costs 75%
34.4% Standard Costs
65.6% Hospital Costs

SCHEDULE OF RATES

MAJOR DIAGNOSIS CATEGORY		DIAGNOSIS RELATED GROUPS	1978 HOSPITAL F PAYMENT RATES
01: Infectious Diseases	001	Infectious Disease (Enteritis, Diarrhea) with Age less than 16	$ 326.90
	002	Infectious Disease (Enteritis, Diarrhea) with Age greater than 15	477.09
	003	Infectious Disease (Viral Disease, VD, Meningitis) without Secondary Diagnosis	418.08
	004	Infectious Disease (Viral Disease, VD, Meningitis) with Secondary Diagnosis	578.05
	005	Infectious Disease (Blood Infection, TB, Salmonella) without Surgery	1,401.90
	006	Infectious Disease (Blood Infection, TB, Salmonella) with Surgery	2,162.88
02: Malignant Neoplasm of the Digestive System	007	Cancer of the Mouth, Tongue, Large Intestine, Liver, Gallbladder without Surgery	992.68
	008	Cancer of the GI System (Esophagus, Stomach, Pancreas, Small Intestine, Rectum) without Surgery	1,196.86
	009	Cancer of the GI System with Surgical Procedure (Biopsy, Endoscopy, Local Excision, Centesis) without Secondary Diagnosis	1,222.88
	010	Cancer of the GI System with Surgical Procedure (Biopsy, Endoscopy, Local Excision, Draining) with Secondary Diagnosis	1,882.73
	011	Cancer of the GI System with Surgery (Gastric Resection, Colon Resection, Esophagus Resection)	2,884.62
03: Malignant Neoplasm of the Respiratory System	012	Cancer of the Respiratory System (Trachea, Lung, Larynx, Thorax, Mediastinum) without Surgery without Secondary Diagnosis	731.96
	013	Cancer of the Respiratory System (Trachea, Lung, Larynx, Thorax, Mediastinum) without Surgery with Secondary Diagnosis	1,252.43
	014	Cancer of the Respiratory System with Surgical Procedure (Biopsy, Endoscopy, Excision of Lesion) without Secondary Diagnosis	1,036.04
	015	Cancer of the Respiratory System with Surgical Procedure (Biopsy, Endoscopy, Excision of Lesion) with Secondary Diagnosis	1,658.84
	016	Cancer of the Respiratory System with Surgery (Lobectomy, Laryngectomy, Radical Resection)	2,903.93
04: Malignant Neoplasm of the Skin	017	Cancer of the Skin except Malignant Melanoma without Secondary Diagnosis	427.88
	018	Cancer of the Skin except Malignant Melanoma with Secondary Diagnosis	917.07
	019	Cancer of the Skin - Malignant Melanoma with Surgical Procedure without Secondary Diagnosis	984.33
	020	Cancer of the Skin - Malignant Melanoma with Surgical Procedure with Secondary Diagnosis	1,289.82
05: Malignant Neoplasm of the Breast	021	Cancer of the Breast without Surgery with Age less than 63	753.61
	022	Cancer of the Breast without Surgery with Age greater than 62	1,628.43

		023	Cancer of the Breast with Surgery without Secondary Diagnosis	1,045.39
		024	Cancer of the Breast with Surgery with Secondary Diagnosis	1,352.31
06:	Malignant Neoplasm of the Female Reproductive System	025	Cancer of the Female Reproductive System (Uterus, Cervix, Vagina, Ovary, Fallopian Tube) without Surgery without Secondary Diagnosis	944.42
		026	Cancer of the Female Reproductive System (Uterus, Cervix, Vagina, Ovary, Fallopian Tube) without Surgery with Secondary Diagnosis	986.45
		027	Cancer of the Female Reproductive System with Surgical Procedure (D&C, Biopsy, Excision of Lesion) without Secondary Diagnosis	471.80
		028	Cancer of the Female Reproductive System with Surgical Procedure (D&C, Biopsy, Excision of Lesion) with Secondary Diagnosis	1,356.86
		029	Cancer of the Uterus Body with Surgery (Removal of Uterus)	1,465.82
		030	Cancer of the Uterus, Cervix, Ovary with Surgery (Removal of Uterus or other Major Operation)	2,651.70
07:	Malignant Neoplasm of the Male Reproductive System	031	Cancer of the Male Reproductive System (Penis, Prostate, Testicle) without Surgery	1,084.46
		032	Cancer of the Male Reproductive System with Surgical Procedure (Biopsy, Cystoscopy, Removal of Testicle) without Secondary Diagnosis	928.66
		033	Cancer of the Male Reproductive System with Surgical Procedure (Biopsy, Cystoscopy, Removal of Testicle) with Secondary Diagnosis	1,512.66
		034	Cancer of the Male Reproductive System with Surgery (Amputation of Penis, Removal of Prostate, Radical Excision of Lesion)	1,830.79
08:	Malignant Neoplasm of the Urinary System	035	Cancer of the Urinary System (Bladder, Urethra, Kidney, Ureter) without Surgery	911.05
		036	Cancer of the Urinary System with Surgical Procedure (Cystoscopy, TUR, Excision of Lesion) without Secondary Diagnosis	609.70
		037	Cancer of the Urinary System with Surgical Procedure (Cystoscopy, TUR, Excision of Lesion) with Secondary Diagnosis	943.66
		038	Cancer of the Urinary System with Surgery (Removal/Excision of Bladder, Kidney, Ureter, Urethra)	1,863.02
09:	Malignant Neoplasm of Other and Unspecified Sites	039	Cancer of the Bone, Thyroid, Connective Tissue, Nerves without Surgery	1,062.60
		040	Cancer of the Brain, Secondary Cancer, Multiple Cancer Sites without Surgery without Secondary Diagnosis	1,408.55
		041	Cancer of the Brain, Secondary Cancer, Multiple Cancer Sites without Surgery with Secondary Diagnosis	1,306.91
		042	Cancer of the Thyroid, Connective Tissue, Nerves with Surgical Procedure (Biopsy, Excision)	1,005.19
		043	Cancer of a Secondary Site, Multiple Sites with Surgical Procedure (Biopsy, Excision)	1,649.08
		044	Cancer of the Bone, Connective Tissue, Nerves, Secondary Site, Multiple Sites with Surgery	3,111.29

10:	Neoplasm of the Lymphatic and Hemopoietic Tissue	045	Tumor of the Lymphatic System, Blood Making Tissue without Secondary Diagnosis with Age less than 16	167.32
		046	Tumor of the Lymphatic System, Blood Making Tissue with Secondary Diagnosis with Age less than 16	939.55
		047	Disease of the Lymphatic System, Hodgkins Disease, Sarcoma without Surgery without Secondary Diagnosis with Age greater than 15	633.54
		048	Disease of the Lymphatic System, Hodgkins Disease, Sarcoma without Surgery with Secondary Diagnosis with Age greater than 15	1,025.33
		049	Tumor of the Lymphatic System, Multiple Myeloma, Leukemia without Surgery with Age greater than 15	2,216.69
		050	Tumor of the Lymphatic System, Blood Making Tissue with Surgical Procedure (Excision of Node) without Secondary Diagnosis with Age greater than 15	1,115.83
		051	Tumor of the Lymphatic System, Blood Making Tissue with Surgical Procedure (Excision of Node) with Secondary Diagnosis with Age greater than 15	2,474.50
		052	Tumor of the Lymphatic System, Blood Making Tissue with Surgery (Splenectomy, Radical Resection) with Age greater than 15	2,020.19
11:	Benign Neoplasm of the Female Reproductive System	053	Benign Tumor (Papilloma, Polyp) of the Uterus, Vagina, Vulva without Secondary Diagnosis	337.88
		054	Benign Tumor (Papilloma, Polyp) of the Uterus, Vagina, Vulva with Secondary Diagnosis	446.34
		055	Benign Tumor (Fibroma) of the Uterus, Ovary without Surgery	267.84
		056	Benign Tumor (Fibroma) of the Uterus, Ovary with Surgical Procedure (D&C, Excision of Lesion) without Second Surgery	368.43
		057	Benign Tumor (Fibroma) of the Uterus, Ovary with Second Surgery	462.33
		058	Benign Tumor (Fibroma) of the Uterus, Ovary with Surgery (Removal of Ovary)	795.87
		059	Benign Tumor (Fibroma) of the Uterus, Ovary with Surgery (Removal of Uterus)	1,021.57
12:	Benign Neoplasm of Other Sites	060	Benign Tumor of the Intestines, Urinary System, without Surgery	934.19
		061	Benign Tumor of the Brain, Pituitary Gland without Surgery	967.64
		062	Benign Tumor of the Skin, Bone, Urinary System (Kidney, Bladder), Connective Tissue with Surgery without Secondary Diagnosis	432.54
		063	Benign Tumor of the Skin, Bone, Urinary System (Kidney, Bladder), Connective Tissue with Surgery with Secondary Diagnosis with Age less than 43	624.72
		064	Benign Tumor of the Skin, Bone, Urinary System (Kidney, Bladder), Connective Tissue with Surgery with Secondary Diagnosis with Age greater than 42	850.90
		065	Benign Tumor of the Intestines, Nerves with Surgical Procedure (Excision, Other) without Secondary Diagnosis	557.33
		066	Benign Tumor of the Intestines, Nerves with Surgical Procedure (Excision, Other) with Secondary Diagnosis	927.08

		067	Benign Tumor of the Intestines, Nerves with Surgery (Colon Resection, Craniotomy, Radical Resection, Other Major Operation)	1,723.23
		068	Benign Tumor of the Stomach, Brain, Respiratory System, Esophagus, Pituitary Gland with Surgery	2,569.74
13:	Diseases of Thyroid and Other Endocrine Glands	069	Disease of the Thyroid (Non-Toxic, Simple), Other Endocrine Glands (Adrenal, Pancreas) without Surgery	858.91
		070	Disease of the Thyroid (Toxic), Low Function Pituitary without Surgery	841.90
		071	Endocrine Disorder with Surgical Procedure (Thyroidectomy, Other)	799.93
		072	Endocrine Disorder with Surgery	2,081.50
14:	Diabetes	073	Diabetes without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age less than 36	688.11
		074	Diabetes without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age greater than 35	731.87
		075	Diabetes without Surgery with Major Secondary Diagnosis	1,106.87
		076	Diabetes with Surgical Procedure (Endoscopy, Biopsy)	1,305.54
		077	Diabetes with Surgery (Amputation of Extremity, Other Major)	3,881.70
15:	Nutritional and Other Metabolic Diseases	078	Metabolic Disorder (Gout, Blood Globulin) without Secondary Diagnosis	281.45
		079	Metabolic Disorder (Gout, Blood Globulin) with Secondary Diagnosis (Nutrition Deficiency)	1,040.87
		080	Metabolic Disease (Cystic Fibrosis, Sprue, Unspecified)	1,258.72
		081	Metabolic Disease (Obesity, Malabsorption, Unspecified)	3,060.71
16:	Diseases of the Blood and Blood Forming Organs	082	Mediterranean Anemia, Hemophilia without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age less than 11	515.55
		083	Mediterranean Anemia, Hemophilia without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis with Age greater than 10	619.20
		084	Disease of Blood Hemoglobin without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	794.48
		085	Disease of the Blood (Anemias), Blood Forming Organs (Spleen) without Surgery with Major Secondary Diagnosis	815.70
		086	Disease of the Blood (Anemias), Blood Forming Organs with Surgery with Age 9-53	1,078.13
		087	Disease of the Blood (Anemias), Blood Forming Organs with Surgery with Age less than 9 or greater than 53	1,749.25
17:	Psychoses Not Attributed to Physical Conditions	088	Schizophrenia (Paranoid, Catatonic, Unspecified) Involutional Melancholia with Psychiatric Service	1,096.27
		089	Schizophrenia (Paranoid, Catatonic, Unspecified) Involutional Melancholia without Psychiatric Service	911.65
		090	Schizophrenia (Affective, Acute Episode), Manic - Depressive Psychosis	1,156.73

18:	Neuroses	091	Neurosis (Anxiety, Hysterical, Phobic, Hypochondriacal Unspecified)	664.65
		092	Neurosis (Obsessive-Compulsive, Depressive), Personality Disorders	874.94
19:	Alcoholic Mental Disorder and Addiction	093	Alcoholism without Secondary Diagnosis or with Minor Secondary Diagnosis	637.15
		094	Alcoholism with Major Secondary Diagnosis (Liver Cirrhosis, Delirium Tremens, Other)	1,060.62
20:	Other Mental Disorders	095	Drug Dependence, Physical Disorder (Probably Psychiatric Origin), Cephalgia	647.68
		096	Psychosis, Non-Psychosis Related Brain Condition	1,324.23
21:	Diseases of the Central Nervous System	097	Epilepsy, Migraine, Brain Disorder (Unspecified) without Surgery without Secondary Diagnosis	468.42
		098	Epilepsy, Migraine, Brain Disorder (Unspecified) without Surgery with Secondary Diagnosis	818.93
		099	Multiple Sclerosis, Paralysis Agitans, Meningitis, Hemiplegia without Surgery	1,179.67
		100	Disease of the Central Nervous System with Surgical Procedure (Nerve Block, Other)	1,974.40
		101	Disease of the Central Nervous System with Surgery (Laminectomy, Spinal Fusion, Ventricular Shunt)	2,934.83
22:	Diseases of the Peripheral Nervous System	102	Facial Paralysis, Neuralgia (Trigeminal, Other Unspecified) without Surgery	686.85
		103	Sciatica, Polyneuritis without Surgery	784.77
		104	Disease of the Median Nerve without Surgery	449.17
		105	Disease of the Peripheral Nerves except Median with Surgical Procedure (Nerve Block, Other Unspecified)	625.49
		106	Disease of the Peripheral Nerves except Median with Surgery (Spinal Cord, Nerve Roots)	1,043.84
23:	Diseases of the Eye	107	Cross Eyedness, Cataract, Cyst of the Eyelid without Surgery	307.21
		108	Glaucoma, Corneal Inflammation/Ulceration, Disease of the Iris, Retina without Surgery	528.53
		109	Disease of the Eye with Surgical Procedure (Muscle Repair of Eyelid, Other)	350.76
		110	Disease of the Eye with Surgical Procedure (Removal of Lens, Incision into Sclera)	572.85
		111	Disease of the Eye with Surgical Procedure (Reattachment of Retina, Repair of Cornea)	888.68
24:	Disease of the Ear and Mastoid Process	112	Disease of the Middle Ear (Infection, Chronic Mastoid Bone Inflammation) without Surgery	304.69

		113	Disease of the Inner Ear (Inflammation, Menieres Disease) without Surgery	559.44
		114	Disease of the Ear with Surgical Procedure (Incision of Membrane, Removal of Adenoids, Other)	225.29
		115	Disease of the Middle Ear with Surgery (Removal of Bone, Repair of Membrane)	452.86
		116	Disease of the Ear with Surgery (Removal of Mastoid Bone, Excision of Middle Ear, Other)	604.90
25:	Hypertensive Heart Diseases	117	Hypertensive Heart Disease without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	661.63
		118	Hypertensive Heart Disease without Surgery with Major Secondary Diagnosis	790.78
		119	Hypertensive Heart Disease (Fatal) with Kidney Involvement without Surgery with Major Secondary Diagnosis	1,329.07
		120	Hypertensive Heart Disease with Surgery	1,100.95
26:	Acute Myocardial Infarction	121	Disease of the Heart - Acute Myocardial Infarction	1,893.09
27:	Ischemic Heart Diseases Except AMI	122	Disease of the Heart, Ischemia (Blood Deficiency) except AMI without Surgery without Secondary Diagnosis	885.64
		123	Disease of the Heart, Ischemia (Blood Deficiency) except AMI without Surgery with Minor Secondary Diagnosis	953.21
		124	Disease of the Heart, Ischemia (Blood Deficiency) except AMI without Surgery with Major Secondary Diagnosis	1,086.77
		125	Disease of the Heart, Ischemia (Blood Deficiency) except AMI with Cardiac Catheterization	938.78
		126	Disease of the Heart, Ischemia (Blood Deficiency) except AMI with Surgical Procedure (Endoscopy, Insertion of Electronic Device)	1,830.50
		127	Disease of the Heart, Ischemia (Blood Deficiency) except AMI with Surgery (Shunt, Other Major)	3,408.62
28:	Arrythmia and Slowed Conduction	128	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	710.34
		129	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction without Surgery with Major Secondary Diagnosis	1,035.18
		130	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction with Replacement of Heart Device or Cardiac Catheterization	1,635.58
		131	Disease of the Heart, Irregular Heart Rhythm, Slowed Conduction with Insertion of Electronic Heart Device	2,564.53
29:	Heart Failure	132	Disease of the Heart, Failure (Poor Function) without Surgery	1,308.39
		133	Disease of the Heart, Failure (Poor Function) with Surgery	2,191.35

30:	Carditis, Valvular and Other Diseases	134	Disease of the Heart, Inflammation, Valve Problem without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	1,085.98
		135	Disease of the Heart, Inflammation, Valve Problem without Surgery with Major Secondary Diagnosis	1,271.15
		136	Disease of the Heart, Inflammation, Valve Problem with Cardiac Catheterization without Secondary Diagnosis or with Minor Secondary Diagnosis	912.38
		137	Disease of the Heart, Inflammation, Valve Problem with Cardiac Catheterization with Major Secondary Diagnosis	1,262.11
		138	Disease of the Heart, Inflammation, Valve Problem with Surgery (Valve Replacement, Other Major)	2,833.29
31:	Cerebrovascular Diseases	139	Circulatory Disorder of the Brain, Occasional Blood Deficiency without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	769.69
		140	Circulatory Disorder of the Brain, Occasional Blood Deficiency without Surgery with Major Secondary Diagnosis	846.73
		141	Blood Clot in Brain Obstructing Circulation without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	1,177.29
		142	Blood Clot in Brain Obstructing Circulation without Surgery with Major Secondary Diagnosis	1,625.06
		143	Brain Hemorrhage (Stroke) without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	1,562.55
		144	Brain Hemorrhage (Stroke) without Surgery with Major Secondary Diagnosis	2,343.18
		145	Circulatory Dysfunction in Brain with Surgery	2,840.39
32:	Diseases of the Vascular System	146	Disease of the Circulatory System, Inflammation of the Lymph Glands, Varicose Veins (Legs), Raynauds Disease without Surgery	547.07
		147	Disease of the Circulatory System (Hardening of Arterial Walls, Arterial Blood Clot) without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	893.49
		148	Disease of the Circulatory System (Hardening of Arterial Walls, Arterial Blood Clot) without Surgery with Major Secondary Diagnosis	1,208.41
		149	Disease of the Circulatory System with Surgical Procedure (Excision of Varicose Veins, Other) with Age less than 51	584.05
		150	Disease of Vascular System with Surgery (Excision of Varicose Veins, Other) with Age greater than 50	873.18
		151	Disease of Vascular System with Surgery (Excision of Nerve, Vessel) without Secondary Diagnosis	1,164.59
		152	Disease of Vascular System with Surgery (Excision of Nerve, Vessel) with Secondary Diagnosis	2,106.84
		153	Disease of Vascular System with Surgery (Arterial Reconstruction, Amputation of Extremity)	2,638.84

33:	Pulmonary Embolism	154	Blood Clot of the Lung without Secondary Diagnosis or with Minor Secondary Diagnosis	1,332.53
		155	Blood Clot of the Lung with Major Secondary Diagnosis	1,677.67
34:	Phlebitis and Thrombophlebitis	156	Inflammation of the Veins, Blood Clot without Secondary Diagnosis or with Minor Secondary Diagnosis	937.70
		157	Inflammation of the Veins, Blood Clot with Major Secondary Diagnosis	1,057.77
35:	Hemorrhoids	158	Hemorrhoids	580.22
36:	Hypertrophy of Tonsil and Adenoid	159	Enlargement of the Tonsils/Adenoids	272.37
37:	Acute Upper Respiratory Tract Infection and Influenza	160	Acute Upper Respiratory Tract Infection, Influenza with Age less than 45	354.59
		161	Acute Upper Respiratory Tract Infection, Influenza with Age greater than 44	1,082.98
38:	Other Diseases of the Upper Respiratory Tract	162	Disease of the Upper Respiratory Tract except Acute Upper Respiratory Infection and Influenza without Surgery	492.16
		163	Disease of the Upper Respiratory Tract with Surgical Procedure (Biopsy, Visualization of the Nasal Septum)	374.05
		164	Disease of the Upper Respiratory Tract with Surgery (Nose Reconstruction, Incision and Drainage of Sinus)	437.35
39:	Pneumonia	165	Pneumonia with Age less than 31	554.89
		166	Pneumonia without Surgery without Seconary Diagnosis with Age greater than 30	754.39
		167	Pneumonia without Surgery with Secondary Diagnosis with Age greater than 30	1,367.30
		168	Pneumonia with Surgery	2,443.45
40:	Bronchitis	169	Bronchitis with Age less than 46	446.35
		170	Bronchitis without Secondary Diagnosis or with Minor Secondary Diagnosis with Age greater than 45	748.00
		171	Bronchitis with Major Secondary Diagnosis with Age greater than 45	1,376.53
41:	Asthma	172	Asthma with Age less than 31	506.10
		173	Asthma without Secondary Diagnosis with Age greater than 30	862.20
		174	Asthma with Secondary Diagnosis with Age greater than 30	1,049.53
42:	Other Lung and Pleural Diseases	175	Lung Collapse, Pleurisy, Pulmonary Congestion without Surgery	952.81
		176	Emphysema, Embyema, Abscess, Acute Swelling without Surgery without Secondary Diagnosis or with Minor Secondary Diagnosis	1,129.38

		177	Emphysema, Empyema, Abscess, Acute Swelling without Surgery with Major Secondary Diagnosis	1,382.49
		178	Disease of the Lung and Pleura with Surgical Procedure (Bronchoscopy, Chest Incision, Other) without Secondary Diagnosis	1,228.08
		179	Disease of the Lung and Pleura with Surgical Procedure (Bronchoscopy, Chest Incision, Other) with Secondary Diagnosis	2,190.09
		180	Disease of the Lung and Pleura with Surgery (Removal of Lobe, Other Major)	4,270.03
43:	Diseases of the Oral Cavity, Salivary Glands and Jaw	181	Minor Problems of the Teeth	271.22
		182	Major Problems of the Teeth (Jaw, Salivary Glands, Other Oral Soft Tissue)	487.38
44:	Gastric and Peptic Ulcer	183	Stomach Ulcer without Surgery without Secondary Diagnosis	631.08
		184	Stomach Ulcer without Surgery with Secondary Diagnosis	916.62
		185	Stomach Ulcer with Surgical Procedure (Biopsy, Visualization, Other)	1,110.39
		186	Stomach Ulcer with Surgery (Removal of Portion of Stomach, Other Major) without Secondary Diagnosis	1,816.57
		187	Stomach Ulcer with Surgery (Removal of Portion of Stomach, Other Major) with Secondary Diagnosis	2,610.00
45:	Upper Gastro-Intestinal Diseases except Gastric and Peptic Ulcer	188	Upper GI Disease Except Stomach Ulcer without Surgery without Secondary Diagnosis	414.94
		189	Upper GI Disease Except Stomach Ulcer without Surgery with Secondary Diagnosis	545.07
		190	Upper GI Disease Except Stomach Ulcer with Surgical Procedure (Visualization, Other Minor) without Secondary Diagnosis	548.88
		191	Upper GI Disease Except Stomach Ulcer with Surgical Procedure (Visualization, Other Minor) with Secondary Diagnosis	869.69
		192	Upper GI Disease Except Stomach Ulcer with Surgery	1,304.56
46:	Appendicitis	193	Appendicitis (without Peritonitis) without Secondary Diagnosis	553.61
		194	Appendicitis (without Peritonitis) with Secondary Diagnosis	891.38
		195	Appendicitis (with Peritonitis, Other) without Secondary Diagnosis	1,153.86
		196	Appendicitis (with Peritonitis, Other) with Secondary Diagnosis	1,933.23
47:	Hernia of the Abdominal Cavity	197	Abdominal Hernia with Age less than 15	327.07
		198	Inguinal Hernia (without Obstruction) with Age greater than 14 and less than 65 without Secondary Diagnosis	634.03
		199	Inguinal Hernia (without Obstruction) with Age greater than 14 and less than 65 with Secondary Diagnosis	658.87
		200	Abdominal Hernia Except Simple Inguinal with Age greater than 14 and less than 65 without Surgery	664.31

		201	Abdominal Hernia Except Simple Inguinal with Age greater than 14 and less than 65 with Minor Surgery	685.09
		202	Abdominal Hernia Except Simple Inguinal with Age greater than 14 and less than 65 with Major Surgery	1,145.64
		203	Abdominal Hernia with Age greater than 64 without Surgery	616.71
		204	Abdominal Hernia with Age greater than 64 with Minor Surgery	680.54
		205	Abdominal Hernia with Age greater than 64 with Major Surgery	1,649.43
48:	Enteritis, Diverticula, and Functional Disorders of the Intestine	206	Functional Disorder of the Intestine without Surgery	493.88
		207	Intestinal Pouching, Regional Enteritis, Ulcerative Colitis without Surgery	717.15
		208	Intestinal Pouching (Functional Disorder) with Minor Surgery without Secondary Diagnosis	701.30
		209	Intestinal Pouching (Functional Disorder) with Minor Surgery with Secondary Diagnosis	944.66
		210	Intestinal Pouching (Functional Disorder) with Major Surgery (Resection, Other)	2,276.95
49:	Diseases of the Anus	211	Disease of the Anus without Secondary Diagnosis	432.38
		212	Disease of the Anus with Secondary Diagnosis	531.09
50:	Miscellaneous Diseases of the Intestine and Peritoneum	213	Miscellaneous Disease of the Intestine and Abdominal Lining with Age less than 56 without Surgery	641.58
		214	Miscellaneous Disease of the Intestine and Abdominal Lining with Age greater than 55 without Surgery without Secondary Diagnosis	595.51
		215	Miscellaneous Disease of the Intestine and Abdominal Lining with Age greater than 55 without Surgery with Secondary Diagnosis	958.84
		216	Miscellaneous Disease of the Intestine and Abdominal Lining with Surgical Procedure (Local Incision, Excision)	605.99
		217	Miscellaneous Disease of the Intestine and Abdominal Lining with Visualization of the Intestine without Secondary Diagnosis	681.50
		218	Miscellaneous Disease of the Intestine and Abdominal Lining with Visualization of the Intestine with Secondary Diagnosis	1,351.32
		219	Miscellaneous Disease of the Intestine and Abdominal Lining with Major Surgery without Secondary Diagnosis	1,685.96
		220	Miscellaneous Disease of the Intestine and Abdominal Lining with Major Surgery with Secondary Diagnosis	3,171.01
51:	Diseases of the Liver	221	Hepatitis,(Infectious, Serum) Subacute Necrosis of the Liver with Age less than 41	756.77

		222	Hepatitis (Infectious, Serum) Subacute Necrosis of the Liver with Age greater than 40	1,074.59
		223	Liver Cirrhosis without Secondary Diagnosis or with Minor Secondary Diagnosis	1,186.16
		224	Liver Cirrhosis with Major Secondary Diagnosis	1,659.91
52:	Diseases of the Gall-Bladder and Bile Duct	225	Disease of the Gallbladder and Bile Duct without Surgery with Age less than 51	516.12
		226	Disease of the Gallbladder and Bile Duct without Surgery with Age greater than 50	788.89
		227	Disease of the Gallbladder and Bile Duct with Surgery without Secondary Diagnosis	1,131.78
		228	Disease of the Gallbladder and Bile Duct with Surgery with Secondary Diagnosis with Age less than 65	1,471.83
		229	Disease of the Gallbladder and Bile Duct with Surgery with Secondary Diagnosis with Age greater than 64	2,055.45
53:	Diseases of the Pancreas	230	Disease of the Pancreas without Surgery	1,021.81
		231	Disease of the Pancreas with Surgery	2,588.70
54:	Diseases of the Kidney and Ureter	232	Disease of the Kidney and Bladder without Surgery without Secondary Diagnosis	516.79
		233	Kidney Inflammation without Surgery with Secondary Diagnosis	852.00
		234	Nephrotic Syndrome, Nephritis (Chronic) Uremia without Surgery with Secondary Diagnosis with Age less than 65	986.99
		235	Nephrotic Syndrome, Nephritis (Chronic) Uremia without Surgery with Secondary Diagnosis with Age greater than 64	2,015.79
		236	Disease of the Ureter, Nephrotic Syndrome, with Surgical Procedure (Cystoscopy, Biopsy, Other Minor)	745.40
		237	Kidney Inflammation and Degenerative Disease (Including Kidney Pelvis) with Surgical Procedure	1,108.76
		238	Disease of the Kidney and Ureter with Surgery (Kidney Removal, Kidney Transplant, Other Major)	2,447.64
55:	Urinary Calculus	239	Urinary Stone without Surgery without Secondary Diagnosis	270.07
		240	Urinary Stone without Surgery with Secondary Diagnosis	467.58
		241	Urinary Stone with Surgical Procedure (Visualization, Catheter to Kidney Other)	665.82
		242	Urinary Stone with Surgery (Incision and Drainage of Kidney, Bladder, Ureter and Other Major)	1,362.07
56:	Cystitis and Other Urinary Diseases	243	Bladder Inflammation with Other Urinary Disease without Surgery without Secondary Diagnosis	430.48
		244	Inflammation of the Bladder and Urethra with Narrowing of the Urethra without Surgery with Secondary Diagnosis	525.01

	245	Bladder (Abnormal Passage, Pouching, Other Disease) without Surgery with Secondary Diagnosis with Age less than 46	544.89
	246	Bladder (Abnormal Passage, Pouching, Other Disease) without Surgery with Secondary Diagnosis with Age greater than 45	867.57
	247	Disease of the Bladder and Urethra with Surgical Procedure (Visualization, Opening	266.63
	248	Disease of the Bladder and Urethra with Surgical Procedure (Visualization, Excision, Dilatation, Repair) with Age less than 15	299.03
	249	Disease of the Bladder and Urethra with Surgical Procedure (Visualization, Excision, Dilatation, Repair) with Age greater than 14	573.65
	250	Disease of the Bladder and Urethra with Surgery (Removal of Bladder, Removal of Prostate, Other Major)	1,694.04
57: Disease of the Prostate	251	Disease of the Prostate without Surgery	519.13
	252	Disease of the Prostate with Surgical Procedure (Bladder Visualization, Dilatation of Urethra, Biopsy) without Secondary Diagnosis	385.82
	253	Disease of the Prostate with Surgical Procedure (Bladder Visualization, Dilatation of Urethra, Biopsy) with Secondary Diagnosis	494.55
	254	Disease of the Prostate with Surgery (Non-Incisional Removal of Prostate) without Secondary Diagnosis	994.72
	255	Disease of the Prostate with Surgery (Non-Incisional Removal of Prostate) with Secondary Diagnosis	1,396.44
	256	Disease of the Prostate with Surgery (Incisional Removal of the Prostate)	1,526.52
58: Disease of the Male Reproductive System	257	Excessive Foreskin over the Glans Penis with Surgery	325.00
	258	Disease of the Male Reproductive System Except Circumcision without Surgery	403.03
	259	Disease of the Male Reproductive System Except Circumcision with Surgery with Age less than 45	423.56
	260	Disease of the Male Reproductive System Except Circumcision with Surgery with Age greater than 44	654.05
59: Disease of the Female Reproductive System	261	Disorder of Menstruation without Surgery	359.42
	262	Disease of the Female Reproductive System Except Disorder of Menstruation without Secondary Diagnosis	479.60
	263	Disease of the Female Reproductive System Except Disorder of Menstruation with Secondary Diagnosis	645.17
	264	Disease of the Female Reproductive System with Surgical Procedures (D&C, Visualization, Removal Fallopian Tubes) without Secondary Diagnosis	313.31
	265	Disease of the Female Reproductive System with Surgical Procedure (D&C, Visualization, Other) with Secondary Diagnosis	395.82
	266	Disease of the Female Reproductive System with Surgery (Removal of Womb, Repair of Female Reproductive Organ, Other Major)	952.24

60:	Diseases of the Breast	267	Benign Breast Tumor, Chronic Cystic Disease without Secondary Diagnosis	356.15
		268	Acute Inflammation of the Breast, Enlarged Breast without Secondary Diagnosis	400.69
		269	Disease of the Breast with Secondary Diagnosis with Age less than 56	492.96
		270	Disease of the Breast with Secondary Diagnosis with Age greater than 55	529.56
61:	Abortion	271	Abortion without Secondary Diagnosis	254.10
		272	Abortion with Secondary Diagnosis	393.58
62:	Obstetrical Diseases of the Antepartum and Puerperium	273	False Labor without Surgery	84.10
		274	Threatened Abortion Premature Separation of the Afterbirth, Other Hemorrhage During Pregnancy without Surgery	273.30
		275	Obstetrical Complications, Poisons in Blood, Excessive Vomiting, Blood Clot Vein-Extremity without Surgery	480.34
		276	Obstetrical Disease Before and After Delivery with Surgical Procedure (D&C, Repair of Neck of Womb)	400.92
		277	Obstetrical Disease Before and After Delivery with Surgery (Removal of Tubes and Ovaries, Other Major)	688.02
63:	Normal Delivery	278	Delivery without Surgery or with Surgery Assisting Delivery	480.94
		279	Delivery with Tying of Tubes, Removal of Tubes	672.07
		280	Delivery with Cesarean Section	806.25
64:	Delivery with Complications	281	Delivery with Complications without Surgery or with Surgery Assisting Delivery	560.39
		282	Delivery with Complications with Cesarean Section	842.74
65:	Diseases of the Skin and Subcutaneous Tissue	283	Excessive Scar Tissue, Excessive Pigment, Fatty Cyst, Other Minor Skin Disease without Secondary Diagnosis	403.66
		284	Excessive Scar Tissue, Excessive Pigment, Fatty Cyst, Other Minor Skin Disease with Secondary Diagnosis	608.28
		285	Skin Inflammation, Abscess, Eczema, Chronic Ulcer without Surgery with Age less than 21	488.12
		286	Skin Inflammation, Abscess, Eczema, Chronic Ulcer without Surgery with Age greater than 20	818.67
		287	Skin Inflammation, Abscess, Eczema, Reddened Skin with Surgery without Secondary Diagnosis	822.04
		288	Skin Inflammation, Abscess, Eczema, Reddened Skin with Surgery with Secondary Diagnosis	1,820.05
		289	Psoriasis, Eruptive Skin Lesions, Chronic Skin Ulcer	1,654.19

66:	Arthritis	290	Arthritis without Surgery with Age less than 65	832.49
		291	Arthritis without Surgery with Age greater than 64	809.47
		292	Arthritis with Surgery (Excision of Bone, Joint, Membrane Surgical Joint Fixation)	882.41
		293	Arthritis with Surgery (Joint Incision, Spinal Fusions, Excision of Tissue Between Vertebrae)	1,521.26
		294	Arthritis with Surgery (Repair and Restoration of Joint, Removal of Membrane between Vertebrae)	2,439.18
67:	Derangement and Displacement of Intervertebral Disc	295	Disorder and Displacement of Disc Between Vertebrae without Surgery	832.53
		296	Disorder and Displacement of Disc Between Vertebrae with Surgery	1,850.74
68:	Diseases of the Bone and Cartilage	297	Rheumatism and Inflammation Tissue Covering Bone, Other Minor Bone Disease without Surgery	626.18
		298	Disease of the Bone, Inflammation of Marrow (Acute, Chronic), Spongy Bone, Unaided Fracture without Surgery	1,529.91
		299	Disease of the Bone, and Bone Tissue Lining, with Surgery (Excision Bone Lining, Repair of Other Joint)	731.73
		300	Disease of the Bone and Bone Tissue Lining with Surgery (Joint Incision, Bone Excision, Bone Fusion)	987.87
		301	Disease of the Bone and Bone Tissue Lining with Surgery (Amputation, Hip Restoration, Other Major)	1,893.12
69:	Other Disease of the Musculo-Skeletal System	302	Inflammation of the Component Parts of the Joints, Curvature of the Spine, Deformed Foot without Surgery	561.75
		303	Backache, Diffuse Disease of Connective Tissue, Inflammation of Muscle without Surgery without Secondary Diagnosis	761.91
		304	Backache, Diffuse Disease of Connective Tissue, Inflammation of Muscle without Surgery with Secondary Diagnosis	1,008.87
		305	Inflammation of the Component Parts of Joints with Deformity (Palm, Finger, Toe) with Surgery	476.62
		306	Other Disease of the Muscle and Bone (Major) with Surgical Procedure	619.15
		307	Other Disease of the Muscle and Bone (Major) with Surgery (Removal, Repair of the Small Joint, Bone)	772.97
		308	Other Disease of the Muscle and Bone (Major) with Surgery (Joining Vertebrae, Other)	1,773.02
70:	Congenital Anomalies	309	Birth Defect (Bone, Stomach, Testicle) without Surgery	417.22

		310	Birth Defect (Heart, Kidney, Other Major) without Surgery	650.34
		311	Birth Defect (Testicle, Skin, Stomach, Other Minor) with Surgery	467.92
		312	Birth Defect (Heart Valve, Other Unspecified Heart Site) with Surgical Procedure (Cardiac Catheterization)	615.88
		313	Birth Defect (Palate, Lip, Hip or Other Extremity) with Surgery (Repair of Mouth, Fixation of Hip)	638.00
		314	Birth Defect (Heart Valve, Other Unspecified Site) with Surgery (Heart Valve, Septal Repair)	2,032.44
		315	Congenital Diseases (Tetralogy of Fallot, Atrial Septal Defect, Hypospadia, Other) with Surgical Procedure (Catheterization, Repair of Urethra)	570.51
		316	Congenital Diseases (Tetralogy of Fallot, Atrial Septal Defect, Other) with Surgery (Valve, Septum, Shunt)	1,235.50
		317	Birth Defect (Spine, Gullet, Large Bowel) with Surgery	1,589.54
71:	Normal Mature Newborn	318	Normal Full Term Newborn	262.13
72:	Certain Diseases and Conditions Peculiar to Newborn Infants	319	Well Baby Care (Pregnancy greater than 9 months), Other Minor Disease or Condition of the Newborn Infant	218.47
		320	Immaturity, Hyaline Membrane Disease, Other Major Disease or Condition of the Infant without Secondary Diagnosis	1,017.83
		321	Immaturity, Hyaline Membrane Disease, Other Major Disease or Condition of the Infant with Secondary Diagnosis	1,184.07
73:	Signs and Symptoms Pertaining to the Nervous, Respiratory, and Circulatory Systems	322	Indications of Nervous, Respiratory, Circulatory System Disease without Surgery without Secondary Diagnosis	484.37
		323	Convulsions, Fainting, Nosebleed, Chest Pain without Surgery with Secondary Diagnosis	711.80
		324	Brain Disorder of Dizziness, Shortness of Breath, Coughing up Blood without Surgery with Secondary Diagnosis	898.19
		325	Indications of Nervous, Respiratory, Circulatory System Disease with Surgical Procedure	594.07
		326	Indications of Nervous, Respiratory, Circulatory System Disease with Major Surgery	1,559.14
74:	Signs and Symptoms Pertaining to the Gastro-Intestinal and Urinary Systems	327	Indications of Gastro-Intestinal, Urinary System Disease without Surgery without Secondary Diagnosis	313.59
		328	Indications of Gastro-Intestinal, Urinary System Disease without Surgery with Secondary Diagnosis	491.67
		329	Indications of Gastro-Intestinal, Urinary System Disease with Surgical Procedure (Visual Inspection, Other)	689.88
		330	Indications of Gastro-Intestinal, Urinary System Disease with Surgery (Abdominal, Other Major)	1,167.61

75:	Miscellaneous Signs, Symptoms, and Ill-Defined Conditions	331	Sterility (Male, Female), Admission for Observation without Surgery	620.16
		332	Chemical Imbalance, Headache, Fever, Other Ill-Defined Indication of Disease without Surgery with Age less than 15	395.41
		333	Chemical Imbalance, Headache, Fever, Other Ill-Defined Indication of Disease without Surgery with Age greater than 14	777.99
		334	Miscellaneous Indication of Disease with Surgical Procedure (Visual Inspection, Other)	363.51
		335	Miscellaneous Indication of Disease with Surgery (Abdominal Surgery, Removal of Uterus, Other Major)	1,548.69
76:	Fractures	336	Fracture (Skull, Face, Forearm, Leg, Foot, Hand) without Surgery with Age less than 30	272.92
		337	Fracture (Skull, Face, Forearm, Leg, Foot, Hand) without Surgery with Age greater than 29	1,002.60
		338	Fracture (Spine, Ribs, Bone of the Upper Arm) without Surgery with Age less than 65	803.88
		339	Fracture (Spine, Ribs, Bone of the Upper Arm) without Surgery with Age greater than 64	1,312.24
		340	Fracture (Thigh Bone, Pelvis, Multiple) without Surgery	1,498.11
		341	Fracture (Nose, Forearm, Hand, Lower Leg, Foot) with Surgical Procedure (Closed Reduction) without Secondary Diagnosis	315.62
		342	Fracture (Nose, Forearm, Hand, Lower Leg, Foot) with Surgical Procedure (Closed Reduction) with Secondary Diagnosis	679.02
		343	Fracture (Lower Jaw, Upper Arm, Ankle) with Surgical Procedure (Closed Reduction, Open Reduction of Face) without Secondary Diagnosis	538.55
		344	Fracture (Lower Jaw, Upper Arm, Ankle) with Surgical Procedure (Closed Reduction, Open Reduction of Face) with Secondary Diagnosis	937.32
		345	Fracture (Arm, Hand, Foot, Shoulder Blade) with Surgery (Open Reduction, External Fixation, Other)	675.60
		346	Fracture(Ankle, Leg Bones) with Surgery (Open Reduction, External Fixation, Other)	1,007.04
		347	Fracture (Thigh Bone, Pelvis) with Surgery (Open Reduction, External Fixation, Other)	2,191.10
		348	Fracture with Major Surgery (Amputation, Restoration of Hip Joint, Other Major)	2,292.59
77:	Dislocations and Other Musculo-Skeletal Injuries	349	Dislocation (Shoulder, Elbow, Wrist, Knee), Sprains (Ankle, Foot, Hand) without Surgery	458.71
		350	Dislocation (Jaw, Hip), Sprains (Knee, Scroiliac, Other Unspecified) without Surgery	706.40

		351	Dislocation (Shoulder, Elbow, Hand), Sprains (Elbow, Wrist, Hand) with Surgery	449.89
		352	Dislocation (Knee, Ankle), Sprains (Shoulder, Knee, Ankle) with Surgery	679.86
		353	Dislocation (Hip, Multiple), Sprains (Hip, Sacroiliac, Other Unspecified) with Surgery	977.48
78:	Internal Injuries of the Cranium, Chest, and Other Organs	354	Internal Injury of the Skull, Other Organ without Surgery without Secondary Diagnosis with Age less than 41	219.43
		355	Internal Injury of the Skull, Other Organ without Surgery with Secondary Diagnosis with Age less than 41	347.84
		356	Internal Injury of the Skull, Other Organ without Surgery with Age greater than 40	623.26
		357	Internal Injury with Surgical Procedure (Suture of Skin, Nerve, Nerve Repair, Other)	568.50
		358	Internal Injury with Surgery (Removal of Spleen, Drainage of Chest Cavity, Excision of Skin)	1,381.10
		359	Internal Injury with Surgery (Opening of Skull, Exploration of Abdominal Cavity)	2,318.14
79:	Open Wounds and Superficial Injuries	360	Open Wound (Uncomplicated), Superficial Injury, Foreign Body without Surgery	304.86
		361	Open Wound (Complicated), Bruise, Multiple Injuries without Surgery without Secondary Diagnosis	311.35
		362	Open Wound (Complicated), Bruise, Multiple Injuries without Surgery with Secondary Diagnosis	581.35
		363	Open Wound (External), Foreign Body with Surgical Procedure (Visualization, Suturing, Other)	382.10
		364	Open Wound (Complicated) of the Head, Multiple Sites with Surgical Procedure (Visualization, Suturing, Other)	605.45
		365	Open Wound (External), Superficial Injury with Surgery (Excision, Other Major)	666.45
		366	Open Wound (Complicated) of the Head, Multiple Sites with Surgery (Excision, Other Major)	775.64
80:	Burns	367	Burn of the 1st Degree (Uncomplicated) Covering less than 20% of the Body	705.54
		368	Burn of the 2nd Degree (Complicated), 3rd Degree Covering more than 20% of the Body	2,627.25
81:	Complications of Medical and Surgical Care	369	Complications of Medical or Surgical Care without Surgery without Secondary Diagnosis	371.88
		370	Complications of Medical or Surgical Care without Surgery with Secondary Diagnosis	1,006.35
		371	Complications of Medical or Surgical Care with Surgical Procedure	326.01
		372	Complications of Medical or Surgical Care with Surgery (Replacement of Heart Device, Repair of Stomach)	1,299.45
		373	Complications of Medical or Surgical Care with Surgery (Revision of Shunt, Other Major)	1,279.99

82:	Adverse Effects of Certain Substances	374	Adverse Effect of a Drug, Toxic Effect of Alcohol without Secondary Diagnosis	302.95
		375	Adverse Effect of a Drug, Toxic Effect of Alcohol with Secondary Diagnosis	666.65
		376	Toxic Effect (Lead, Acid, Alkali, Carbon Monoxide, Radiation) without Secondary Diagnosis	380.33
		377	Toxic Effect (Lead, Acid, Alkali, Carbon Monoxide, Radiation) with Secondary Diagnosis	1,102.82
83:	Special Admissions and Examinations without Reported Diagnoses	378	Prenatal Care, Medical and Surgical after Care (Dialysis) without Surgery	220.84
		379	Admission for Sterilization, Chemotherapy, Radiation Therapy without Surgery	441.01
		380	Follow up (Cancer) Surgery, Medical after Care (Colostomy, Orthopedic, Other) without Surgery	655.25
		381	Special Admission with Surgery (Sterilization, D&C, Other)	336.54
		382	Special Admission with Surgical Procedure (Bladder Visualization, Removal of Fixed Internal Device)	403.55
		383	Special Admission with Surgery (Exploration of Abdominal Cavity, Removal of Uterus, Other Major)	1,160.12
84:	Outliers	384	Outlier Group 1	1,783.48
		385	Outlier Group 2	2,860.30
		386	Outlier Group 3	3,369.64
		387	Outlier Group 4	3,888.37
		388	Outlier Group 5	5,524.48
		389	Outlier Group 6	5,815.52
		390	Outlier Group 7	5,575.74
		391	Outlier Group 8	9,692.63
		392	Outlier Group 9	9,287.37
		393	Outlier Group 10	10,217.51

C.2. The Simulation: Institutional Costs

Applying the patient care variable rate to the actual case-mix of the eighteen hospitals produced an overall patient care budget composed, on the average, of 34.4% standard /65.6% hospital costs. As with the study on cost variation across hospitals, the methodology's natural level implied a higher degree of confidence than the overall initial goal set for the system, 25% standard/75% hospital cost. However, for the reasons set forth earlier, in order to preserve the balance implied in the overall system goal set forth above, the Institutional Cost portion of the rate, which covers support functions such as administration, fiscal, maintenance, as well as teaching, (see section III.B) was adjusted accordingly. Since there are approximately three patient care dollars to each institutional dollar in the system, an institutional rate composed of 6.5% standard (see section IV.D.1 for a more complete explanation) 93.5 hospital cost was used and resulted in an overall system rate composed of 25% standard/ 75% hospital. Finally, Capital Facilities Costs are included at the SHARE APR reimbursement levels in order to preserve the overall initial system goal of 25% standard/75% hospital costs.

C.3. The Simulation: Payment Illustration

In the chart which follows, hospitals are ranked from A to R, from most to least efficient, based on their relative cost performance. The term "Estimated Budget" refers to a hospital's 1976 actual costs projected for inflation, changes in patient and teaching volume, and changes in capital. The estimated budgets are included as a theoretical basis of comparison simply to show the redistribution of these dollars which would have been affected by rewarding hospitals for productivity during 1978.

The results reveal three basic classes of hospitals: I. A-E, most efficient; II. F-L, average; and III. M-R, least efficient. A review of the two portions of the total budget shows that on the whole, the majority of the eighteen hospitals generally operated below the standard in patient care and above the standard in institutional costs. The most efficient hospital did well in both categories and would receive an overall reward of 5.41% by maintaining its current standard of performance. Hospital R, inefficient in both, would have to eliminate a similar percentage of inefficiency, 5.15%, before beginning to earn incentive dollars.

Some interesting anomalies occur. In Group II, Average, year end results are impossible to predict because the percentage swings are so small and incentive gains would depend on performance vis a vis actual case-mix. Nevertheless, hospital F, the first hospital in this range, shows relatively efficient performance in both patient care and institutional costs, resulting in a slight overall reward of .6%. On the other hand, hospital L, the last hospital in Group II, showed substantially more efficiency in patient care than hospital F, but considerable inefficiency in institutional costs, thus producing an overall comparison to the estimated

budget of 1.16%. It should be noted that these observations are based on 1976 actual experience and are not intended to predict the actual impact of the system on hospital costs had prospective incentive payments been in place for 1978.

Each participating hospital has been provided with a separate calculation, using the same payor and hospital adjustments currently used by SHARE, (see section III.D.) which compares Blue Cross per diems derived through the two systems. This calculation is provided as a convenience only! Please note that a different methodology, appropriate to the DRG system, will be used to apportion Blue Cross costs and to calculate the January 1979 interim rate during which this option may be offered to the participating hospitals for Blue Cross patients only. (See section I.E.) Following recommendations by the Financial Elements Committee and the Payor Committee, expected to commence during the Fall , a different form of methodology may be used to adjust for the situation where all payors are covered.

FIGURE 3

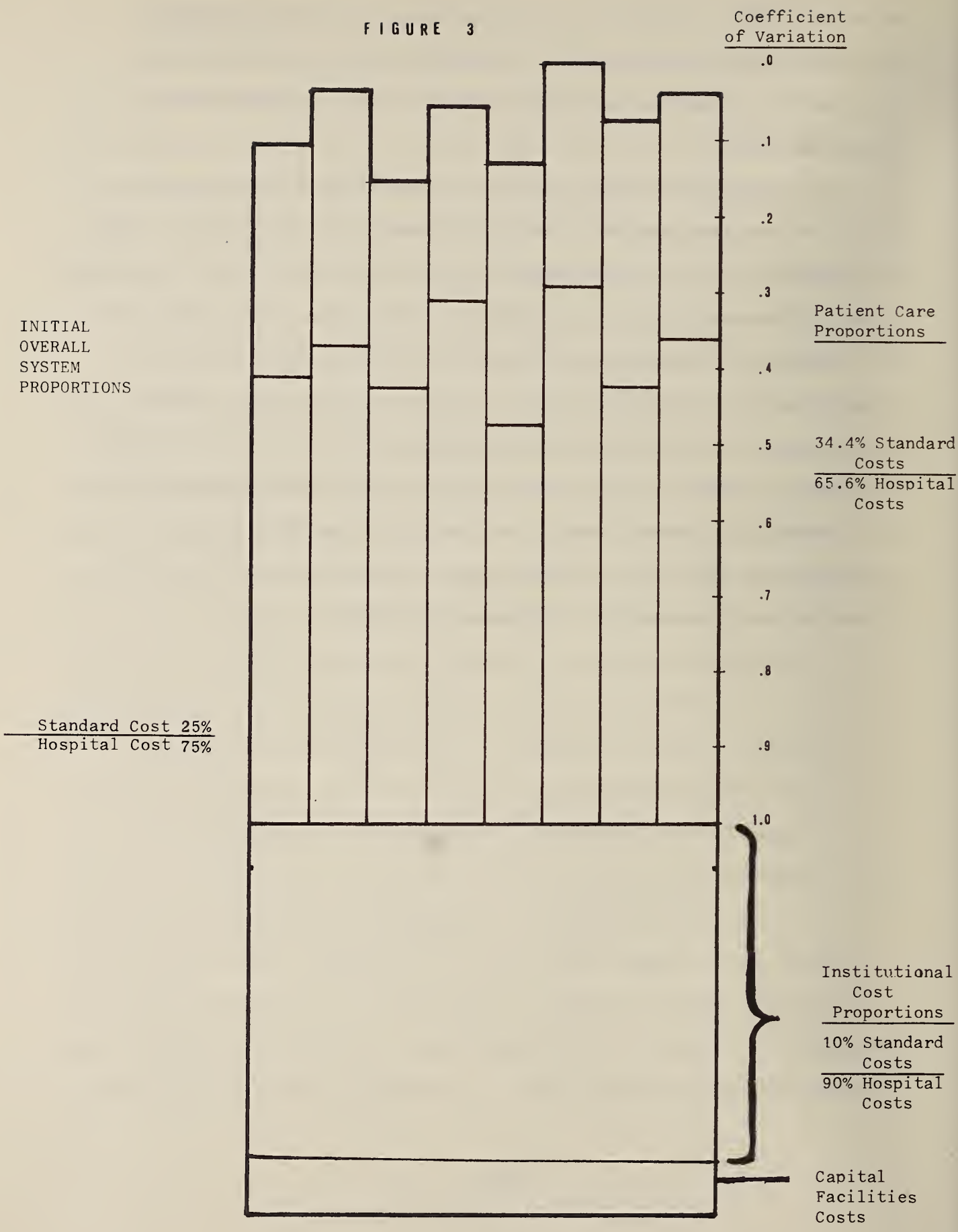

Coefficient of Variation
.0
.1
.2
.3
.4
.5
.6
.7
.8
.9
1.0
INITIAL OVERALL SYSTEM PROPORTIONS
Standard Cost 25%
Hospital Cost 75%
Patient Care Proportions
34.4% Standard Costs
65.6% Hospital Costs
Institutional Cost Proportions
10% Standard Costs
90% Hospital Costs
Capital Facilities Costs

TABLE III

Illustration of Payment Simulation

HOSPITAL	PATIENT CARE 34.4% standard/65.6% hospital			INSTITUTIONAL COSTS 6.5% standard/93.5% hospital			CAPITAL FACILITIES[1]	TOTAL 25% standard/75% hospital		
	EST. BUDGET	DRG PAYMENT	PERCENT DIFFERENCE	EST. BUDGET	DRG PAYMENT	PERCENT DIFFERENCE		EST. BUDGET	DRG SIMULATION PAYMENT	PERCENT DIFFERENCE
I. A	9190537	9754791	6.14	2225972	2310729	3.81	580000	11996509	12645520	5.41
B	6637068	7098331	6.95	2405144	2364094	-1.71	1294000	10336212	10756425	4.07
C	9063325	9600512	5.93	2863938	2835681	-0.99	1337000	13264263	13773193	3.84
D	14108286	14907254	5.66	4851550	4790009	-1.27	1716000	20675836	21413262	3.57
E	11296684	11657655	3.20	3066033	3039410	-0.87	1246000	15608717	15943065	2.14
II. F	19852944	19870864	0.09	7646820	7805568	2.08	1793000	29292764	29469432	0.60
G	21277029	21439797	0.76	7474015	7288701	-2.48	3060000	31811044	31788498	-0.07
H	6470551	6457467	-0.20	1607312	1612767	0.34	1088000	9165863	9158234	-0.08
I	4342076	4337459	0.11	1530998	1499151	-2.08	1071000	6944074	6907610	-0.53
J	19170576	19027008	-0.75	8075811	7916516	-1.97	2299000	29545387	29242524	-1.03
K	4229320	4254107	0.59	1214321	1121097	-7.68	568000	6011641	5943204	-1.14
L	10489706	10778316	2.75	5023834	4541144	-9.61	1294000	16807540	16613460	-1.16
III. M	5780394	5820156	0.69	2656158	2478159	-6.70	916000	9352552	9214315	-1.48
N	15296407	15053735	-1.59	5091028	4997895	-1.83	670000	21057435	20721630	-1.60
O	18935168	18376800	-2.95	5980044	5913085	-1.12	2365000	27280212	26654885	-2.29
P	12302640	11665670	-5.18	2957643	3081509	4.19	1023000	16283283	15770179	-3.15
Q	16806992	16065289	-4.41	5500873	5429613	-1.30	1383000	23690865	22877902	-3.43
R	16178971	15396046	-4.84	7735402	7203175	-6.88	1610000	25524373	24209221	-5.15

[1]Capital Facilities Costs are set at the 1978 SHARE Approved Payment Rate.

D. Standard, Timing, Goals

It is the goal of the system, "to provide for the financial solvency of a hospital which is properly utilized and which delivers, effectively and efficiently, appropriate and necessary health care services of a high quality required by its mix of patients," (Certified Revenue Base, section 2L). At this point in time, the projected payment rates provide only the basis for a simulated Preliminary Cost Base for eighteen New Jersey hospitals projected from 1976 data. Many operational and methodological steps must be taken by the entire health care community before the first Revenue Base is certified. Many parties, including the HCAB, the Commission, HCFA, Medicare, Medicaid, Blue Cross, other payors, self-pay representatives, the Department of Insurance, Medical Society, the Hospital Association, the hospitals, PSROs, the Public Advocate, and numerous others, will have a hand in shaping the system before the first Preliminary Cost Base is ever established. Therefore, the ideas set forth below are offered only to stimulate discussion in the hope that these problems may be resolved as quickly as possible.

A balanced sample representative of the New Jersey hospital community as a whole could be formulated in order to generate the standard and all New Jersey hospitals phased into the system gradually over a three year period. Alternatively, New Jersey hospitals might be divided into three balanced groups. Although the first group might include a larger proportion of institutions with revenue problems due to unrecovered indigency costs, each group would represent a weighted cross-section of the New Jersey hospital community based on characteristics such as size, location and relative efficiency performance. This balance is required both to

create the proper dynamic among hospitals and to protect the public in terms of payout. A rate period would be set, perhaps three years, and a rate design similar to the one described in this simulation established for group one.

The spread in relative efficiency levels observed among hospitals in the simulation suggests that considerable improvement could be achieved at the less efficient institutions with only a modest amount of effort. Were the system goal over a three year rate period to be established at the 25/75 proportions suggested here, a substantial amount of incentive savings could be generated by the end of the period. Therefore, should the Commission make any individual alterations to the rate in order to expand the time-phasing process, it is suggested that these additional monies be offset against future incentive gains (in the form of a loan from the public) or that the reward monies available to efficient institutions be reduced proportionately (in the form of a loan from sister institutions.) In this way, the public is protected because the system always closes and total expenditures are held constant (controlling for inflation) during the rate period. Thus, one way in which the Commission could balance rewards and incentives over the rate period is to vary the proportions each year: for example, 10% standard/ 90% hospital cost in year one: 25% standard/75% hospital cost in year two; 35% standard/65% hospital cost in year three.

During the rate period, hospital medical and administrative staffs would be supplied with the valuable management information provided by this system. Although management reports are discussed in detail in section V,

the following three tables are included here in order to illustrate the kinds of progress which could be made by individual hospital. Table IV.A ranks DRGs in order of their high cost variance over the standard. The ranking suggests a priority of investigation in terms of areas in which intervention will produce the greatest incentive benefit. The report also distinguishes length of stay from other cost considerations. Bearing in mind the various imprecisions which have been documented in this report[9] and those which preceded it, the information suggests a length of stay problem with newborns (DRGs 278, 318), as opposed to a cost problem with strokes, (DRG 144). Table IV.B which helps to isolate the particular cost center in which the problem may be occurring, is described in more detail in section V.

As noted, Table IV.C helps to identify various areas in which the hospital performs efficiently. Thus, for example, a consistent picture is presented of efficiency in both cost and length of stay in its treatment of cardiac cases. Since S.446 directs us to consider the "health care system as a whole", properly identifying such patterns through planning and encouraging them in the appropriate way through reimbursement is a cornerstone in the system. This same information across 18 hospitals and 383 DRGs, will be formatted in a variety of ways in the Annual Report to help to understand relationships between cost, and other factors such as volume,

[9] Since the basis of this information is 1976 data, the institution may have already taken remedial action. This fact, however, underscores the importance of basing the rate and the management information on the most current actual costs available. Thus, the rate and reports for mid-year 1979 can be generated only as quickly as the hospitals submit their 1978 financial, statistical, and patient information.

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
TABLE IV-A HIGH VARIANCE DRGS
HOSPITAL 0051 OVERLOOK H

DRG	DESCRIPTION		AVERAGE LOS	AVERAGE COST	--NUMBER OF -- CASES		TOTAL COST FOR ALL CASES IN DRG		% OF TOTAL PATIENT CARE COSTS	
TEN LOWEST RANKED BY TOTAL DOLLAR VARIANCE FROM NJII AVEREGE										
278	DELIVERY WO OP OR W OP ASSISTING DELIVERY	HOSPITAL	4.6	[illegible]	HOSPITAL	1264	HOSPITAL	558790	HOSPITAL	4.08
		STANDARD	3.9	[illegible]	HOSP %	6.42	NJII AVE.	509795	NJII	3.47
		VARIANCE	-0.6	-70	NJII %	0.60	VARIANCE	-88995		
		% VARIANCE	-16.16	-17.37			% VARIANCE	-17.46		
318	NORMAL FULL TERM NEW BORN	HOSPITAL	4.8	[illegible]	HOSPITAL	1719	HOSPITAL	425343	HOSPITAL	2.90
		STANDARD	4.2	[illegible]	HOSP %	8.73	NJII AVE.	379655	NJII	2.58
		VARIANCE	-0.6	-[illegible]	NJII %	0.82	VARIANCE	-45688		
		% VARIANCE	-13.40	-11.[illegible]			% VARIANCE	-12.03		
144	BRAIN-HEMORRHAGE(STROKE) WO OPER W MAJOR DX2	HOSPITAL	17.8	[illegible]	HOSPITAL	114	HOSPITAL	243525	HOSPITAL	1.66
		STANDARD	18.5	[illegible]	HOSP %	0.58	NJII AVE.	209547	NJII	1.43
		VARIANCE	0.7	-[illegible]	NJII %	0.05	VARIANCE	-33978		
		% VARIANCE	3.88	-16.[illegible]			% VARIANCE	-16.21		
227	DIS OF GALLBLADDER & BILE DUCT W OPER WO DX2	HOSPITAL	11.0	[illegible]	HOSPITAL	156	HOSPITAL	174563	HOSPITAL	1.19
		STANDARD	10.1	[illegible]	HOSP %	0.79	NJII AVE.	143604	NJII	0.98
		VARIANCE	-0.9	-[illegible]	NJII %	0.07	VARIANCE	-30959		
		% VARIANCE	-9.00	-21.[illegible]			% VARIANCE	-21.56		
228	DIS OF GALLBLADDER & BILE DUCT W OPER W DX2 W AGE <65	HOSPITAL	14.1	[illegible]	HOSPITAL	94	HOSPITAL	138105	HOSPITAL	0.94
		STANDARD	12.1	[illegible]	HOSP %	0.48	NJII AVE.	110336	NJII	0.75
		VARIANCE	-2.0	-[illegible]	NJII %	0.04	VARIANCE	-27769		
		% VARIANCE	-16.40	-25.[illegible]			% VARIANCE	-25.17		
348	FRAC OF BONE W AMPUTATION,RESTORATION OF HIP JOINT,OTH MAJ OPER	HOSPITAL	24.0	[illegible]	HOSPITAL	125	HOSPITAL	261340	HOSPITAL	1.78
		STANDARD	19.9	[illegible]	HOSP %	0.63	NJII AVE.	236390	NJII	1.61
		VARIANCE	-4.1	-[illegible]	NJII %	0.06	VARIANCE	-24950		
		% VARIANCE	-20.88	-10.[illegible]			% VARIANCE	-10.55		
094	ALCOHOLISM W LIVER CIRRHOSIS,DELIRIUM TREMENS OR OTHER MAJOR DX2	HOSPITAL	12.0	[illegible]	HOSPITAL	50	HOSPITAL	50665	HOSPITAL	0.35
		STANDARD	7.6	[illegible]	HOSP %	0.25	NJII AVE.	32215	NJII	0.22
		VARIANCE	-4.4	-[illegible]	NJII %	0.02	VARIANCE	-18450		
		% VARIANCE	-58.01	-57.[illegible]			% VARIANCE	-57.27		
339	FRAC(SPINE,RIB,BONE OF UPPER ARM)WO OPER W AGE >64	HOSPITAL	16.3	[illegible]	HOSPITAL	54	HOSPITAL	67892	HOSPITAL	0.46
		STANDARD	12.1	[illegible]	HOSP %	0.27	NJII AVE.	50018	NJII	0.34
		VARIANCE	-4.1	-[illegible]	NJII %	0.03	VARIANCE	-17874		
		% VARIANCE	-34.08	-35.[illegible]			% VARIANCE	-35.74		
340	FRAC(THIGH BONE,PELVIS,MULTIPLE)WO OPER	HOSPITAL	20.6	[illegible]	HOSPITAL	58	HOSPITAL	80690	HOSPITAL	0.55
		STANDARD	15.0	[illegible]	HOSP %	0.29	NJII AVE.	63294	NJII	0.43
		VARIANCE	-5.5	-[illegible]	NJII %	0.03	VARIANCE	-17396		
		% VARIANCE	-36.66	-27.[illegible]			% VARIANCE	-27.48		

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
TABLE IV.B PATIENT SERVICE COSTS BY DRG BY COST CENTER
HOSPITAL 0051 OVERLOOK H

DRG NO.	HOSP RANK		AVERAGE COST PER CASE BY COST CENTER																	
			CCA	EDG	LAB	NMD	RAD	BBK	CSS	DEL	DIA	ORR	OPM	PHM	PHT	RSP	THR	DTY	HKP	L&L	MRD
123	31	HOSP AVG	6	27	104	9	46	0	32	0	0	0	0	31	2	17	0	97	40	23	15
		STANDARD	7	27	104	9	47	1	32	0	0	1	1	31	2	18	0	98	41	24	15
		VARIANCE	1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	1	1	1	0
		% VAR	14.3	0.0	0.0	0.0	2.1	100.0	0.0	0.0	0.0	100.0	100.0	0.0	0.0	5.6	0.0	1.0	2.4	4.2	0.0
271	32	HOSP AVG	0	0	21	0	1	0	25	0	0	48	0	3	0	1	0	10	12	6	8
		STANDARD	0	0	34	0	5	1	33	0	0	62	0	8	0	1	0	19	15	7	8
		VARIANCE	0	0	13	0	4	1	8	0	0	14	0	5	0	0	0	9	3	1	0
		% VAR	0.0	0.0	38.2	0.0	80.0	100.0	24.2	0.0	0.0	22.6	0.0	62.5	0.0	0.0	0.0	47.4	20.0	14.3	0.0
93	33	HOSP AVG	0	5	61	5	24	3	15	0	0	0	0	13	2	24	0	72	35	19	13
		STANDARD	0	8	72	8	25	4	24	0	0	1	0	23	1	8	0	77	48	17	13
		VARIANCE	0	3	11	3	1	1	9	0	0	1	0	10	-1	-16	0	5	13	-2	0
		% VAR	0.0	37.5	15.3	37.5	4.0	25.0	37.5	0.0	0.0	100.0	0.0	43.5	-100.0	-200.0	0.0	6.5	27.1	-11.8	0.0
125	34	HOSP AVG	250	21	57	1	20	0	27	0	0	2	0	15	0	11	0	47	43	40	11
		STANDARD	195	32	69	3	53	0	53	0	0	2	0	24	0	8	0	60	48	33	12
		VARIANCE	-55	11	12	2	33	0	26	0	0	0	0	9	0	-3	0	13	5	-7	1
		% VAR	-28.2	34.4	17.4	66.7	62.3	0.0	49.1	0.0	0.0	0.0	0.0	37.5	0.0	-37.5	0.0	21.7	10.4	-21.2	8.3
144	35	HOSP AVG	0	13	183	29	95	22	116	0	0	0	234	91	59	60	0	225	79	50	23
		STANDARD	0	22	144	22	56	4	114	0	0	1	47	93	54	40	0	273	76	46	25
		VARIANCE	0	9	-39	-7	-39	-18	-2	0	0	1	-187	2	-5	-20	0	48	-3	-4	2
		% VAR	0.0	40.9	-27.1	-31.8	-69.6	-450.0	-1.8	0.0	0.0	100.0	-397.9	2.2	-9.3	-50.0	0.0	17.6	-3.9	-8.7	8.0
109	36	HOSP AVG	0	2	17	0	6	0	32	0	0	107	0	9	0	1	0	18	18	12	8
		STANDARD	0	3	22	0	7	0	41	0	0	111	0	11	0	1	0	22	18	11	8
		VARIANCE	0	1	5	0	1	0	9	0	0	4	0	2	0	0	0	4	0	-1	0
		% VAR	0.0	33.3	22.7	0.0	14.3	0.0	22.0	0.0	0.0	3.6	0.0	18.2	0.0	0.0	0.0	18.2	0.0	-9.1	0.0
167	37	HOSP AVG	0	11	179	12	65	0	103	0	0	0	7	119	3	102	0	101	51	28	16
		STANDARD	0	14	145	10	46	7	72	0	0	1	1	102	3	98	0	124	48	26	18
		VARIANCE	0	3	-34	-2	-19	7	-31	0	0	1	-6	-17	0	-4	0	23	-3	-2	2
		% VAR	0.0	21.4	-23.4	-20.0	-41.3	100.0	-43.1	0.0	0.0	100.0	-600.0	-16.7	0.0	-4.1	0.0	18.5	-6.3	-7.7	11.1
211	38	HOSP AVG	0	4	32	0	9	0	34	0	0	86	0	8	0	3	0	25	22	14	8
		STANDARD	0	3	35	0	10	0	44	0	0	82	0	14	0	1	0	38	24	15	9
		VARIANCE	0	-1	3	0	1	0	10	0	0	-4	0	6	0	-2	0	13	2	1	1
		% VAR	0.0	-33.3	8.6	0.0	10.0	0.0	22.7	0.0	0.0	-4.9	0.0	42.9	0.0	-200.0	0.0	34.2	8.3	6.7	11.1
88	39	HOSP AVG	0	7	39	7	26	3	22	0	0	0	0	25	0	0	0	142	65	35	21
		STANDARD	0	7	39	9	19	1	26	0	0	2	0	33	0	1	0	142	82	29	20
		VARIANCE	0	0	0	2	-7	-2	4	0	0	2	0	8	0	1	0	0	17	-6	-1
		% VAR	0.0	0.0	0.0	22.2	-36.8	-200.0	15.4	0.0	0.0	100.0	0.0	24.2	0.0	100.0	0.0	0.0	20.7	-20.7	-5.0
264	40	HOSP AVG	0	3	33	0	8	0	28	0	0	64	0	4	0	2	0	13	15	8	8
		STANDARD	0	3	36	0	9	1	32	0	0	71	0	7	0	2	0	20	17	9	8
		VARIANCE	0	0	3	0	1	1	4	0	0	7	0	3	0	0	0	7	2	1	0
		% VAR	0.0	0.0	8.3	0.0	11.1	100.0	12.5	0.0	0.0	9.9	0.0	42.9	0.0	0.0	0.0	35.0	11.8	11.1	0.0

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
TABLE IV.C HIGH VARIANCE DRGS
HOSPITAL 0051 OVERLOOK H

DRG	DESCRIPTION		AVERAGE LOS	AVERAGE COST	--NUMBER OF -- CASES		TOTAL COST FOR ALL CASES IN DRG		% OF TOTAL PATIENT CARE COSTS	
TEN HIGHEST RANKED BY TOTAL DOLLAR VARIANCE FROM NJII AVERAGE										
153	DIS OF VASCULAR SYST EM W ARTERY RECONSTR UCTION,AMPUTATION EX TREMITY	HOSPITAL	18.8	2148	HOSPITAL	77	HOSPITAL	165461	HOSPITAL	1.13
		STANDARD	24.7	2724	HOSP %	0.39	NJII AVE.	209729	NJII	1.43
		VARIANCE	5.9	576	NJII %	0.04	VARIANCE	44268		
		% VARIANCE	23.97	21.15			% VARIANCE	21.11		
121	DIS-HEART,MYOCARDIAL INFARCTION (ACUTE)	HOSPITAL	13.8	1597	HOSPITAL	248	HOSPITAL	398772	HOSPITAL	2.72
		STANDARD	16.5	1769	HOSP %	1.26	NJII AVE.	441496	NJII	3.01
		VARIANCE	2.7	173	NJII %	0.12	VARIANCE	42724		
		% VARIANCE	16.27	9.72			% VARIANCE	9.68		
131	DIS-HEART,IRREG HEAR T RYTHM,SLOW CONDUCT ION W INSERTION OF E LEC HEART DE	HOSPITAL	11.4	1944	HOSPITAL	54	HOSPITAL	104991	HOSPITAL	0.72
		STANDARD	15.3	2654	HOSP %	0.27	NJII AVE.	143330	NJII	0.98
		VARIANCE	3.9	710	NJII %	0.03	VARIANCE	38339		
		% VARIANCE	25.62	26.75			% VARIANCE	26.75		
124	DIS-HEART,ISCHEMIA (BLOOD DEFICIENCY) EX C AMI(DRG121) WO OPE R W MAJOR DX	HOSPITAL	8.5	913	HOSPITAL	244	HOSPITAL	222789	HOSPITAL	1.52
		STANDARD	10.6	1147	HOSP %	1.24	NJII AVE.	255516	NJII	1.74
		VARIANCE	2.1	234	NJII %	0.12	VARIANCE	32727		
		% VARIANCE	19.64	12.80			% VARIANCE	12.81		
138	DIS-HEART,INFLAMMATI ON,VALVE PROB W VALV E OPER OR OTHER MAJO R OPER	HOSPITAL	18.6	2224	HOSPITAL	17	HOSPITAL	37817	HOSPITAL	0.26
		STANDARD	20.7	3302	HOSP %	0.09	NJII AVE.	56140	NJII	0.38
		VARIANCE	2.1	1078	NJII %	0.01	VARIANCE	18323		
		% VARIANCE	10.17	32.65			% VARIANCE	32.64		
294	ARTHRITIS W REPAIR & RESTORATION (JOINT, HIP) REM MEMBRANE BE TWEEN VERTEB	HOSPITAL	19.2	1989	HOSPITAL	64	HOSPITAL	127311	HOSPITAL	0.87
		STANDARD	21.6	2267	HOSP %	0.33	NJII AVE.	145114	NJII	0.99
		VARIANCE	2.4	278	NJII %	0.03	VARIANCE	17803		
		% VARIANCE	11.34	12.26			% VARIANCE	12.27		
011	CA-GI SYST W OPER(GA STRIC RES,COLON RES, ESOPHAGUS RES)	HOSPITAL	21.8	2494	HOSPITAL	119	HOSPITAL	296867	HOSPITAL	2.02
		STANDARD	24.7	2642	HOSP %	0.60	NJII AVE.	314393	NJII	2.14
		VARIANCE	2.9	148	NJII %	0.06	VARIANCE	17526		
		% VARIANCE	11.73	5.60			% VARIANCE	5.57		
204	ABD HERNIA W AGE >64 W MIN REPAIR OPER	HOSPITAL	6.1	596	HOSPITAL	98	HOSPITAL	58696	HOSPITAL	0.40
		STANDARD	8.0	726	HOSP %	0.50	NJII AVE.	71378	NJII	0.49
		VARIANCE	1.9	130	NJII %	0.05	VARIANCE	12682		
		% VARIANCE	24.17	17.86			% VARIANCE	17.77		
382	SPECIAL ADMISSION W BLADDER VISUALIZATIO N,REMOVAL FIXED DEVI CE(INTERNAL)	HOSPITAL	2.6	337	HOSPITAL	332	HOSPITAL	111962	HOSPITAL	0.76
		STANDARD	3.2	373	HOSP %	1.69	NJII AVE.	123999	NJII	0.84
		VARIANCE	0.5	36	NJII %	0.16	VARIANCE	12037		
		% VARIANCE	17.21	9.65			% VARIANCE	9.71		

occupancy levels, size and location; to help identify the relative strengths and weaknesses of different kinds of institutions: and to help shape an image of the Certified Revenue Base.

Bearing in mind all of the cautions which have been expressed throughout this Quarter Report and those which preceded, this simulation of eighteen self-selected New Jersey hospitals furnishes several purely theoretical benchmarks which should be considered in developing the details for the Certified Revenue Base standard set forth in S.446 and in measuring progress toward its achievement. The simulation reveals a wide spread in relative efficiency levels among the hospitals. Thus, for example, compared to the "Estimate" of patient care dollars used in the simulation (See Table III.) column A, Table V, shows that hospital R, the least efficient overall, could produce incentive money, and in succeeding years savings to the rate payors of New Jersey of $1,816,882 (patient care dollars) only by presenting its own case-mix at a level of efficiency established at the standard used in this report, the average. Columns B, C and D show similar comparisons for the eighteen hospitals using standards derived, respectively from hospital D, an average performer in the efficient range: hospital A, the most efficient overall: and a theoretical standard established by taking the lowest cost across the eighteen hospitals for each DRG in which a hospital treats at least ten patients. Thus, for example, if all eighteen hospitals could perform at least as efficiently as hospital D, $24,388,816 patient care dollars could be saved.

The potential savings described above must be interpreted with great caution. In addition to the theoretical limitations expressed, it is

TABLE V

Potential Savings in Patient Care Budget

	COLUMN A Standard established at mean	COLUMN B Standard established at Hospital D	COLUMN C Standard established at Hospital A	COLUMN D Standard established at lowest cost per DRG by hospital
A	$ + 1,543,660	$ 230,349	$ 0	$ - 1,676,268
B	+ 1,063,705	138,188	+ 40,550	- 1,188,787
C	+ 1,652,515	386,001	- 69,608	- 1,668,591
D	+ 2,198,530	0	+ 218,365	- 2,406,237
E	+ 1,129,850	- 233,127	- 628,880	- 2,548,780
F	+ 61,446	- 1,960,651	- 2,793,475	- 5,556,145
G	+ 389,998	- 1,856,598	- 2,594,260	- 5,545,103
H	+ 56,195	- 757,704	- 702,079	- 1,832,476
I	+ 151,874	- 313,256	- 432,075	- 1,216,265
J	- 1,098,363	- 2,999,956	- 3,725,466	- 6,117,000
K	+ 176,925	- 318,173	- 422,930	- 1,093,525
L	+ 720,910	- 579,771	- 756,426	- 2,517,082
M	+ 233,404	- 396,141	- 603,096	- 1,564,447
N	- 394,199	- 2,048,343	- 2,339,687	- 4,562,393
O	- 1,478,402	- 3,236,622	- 4,050,282	- 6,544,767
P	- 1,783,515	- 2,864,897	- 3,155,872	- 4,566,538
Q	- 2,230,561	- 3,904,170	- 4,201,017	- 6,264,965
R	- 1,816,882	- 3,673,951	- 3,941,846	- 5,998,200
	$ + 577,091	$- 24,388,816	$- 30,158,080	$ -62,867,568

Column A shows the difference for each hospital when comparing the Standard (mean) to the hospitals estimated budget. Columns B and C show, when compared to the Patient Care "Estimate," the potential savings for each hospital which would result from treating its case-mix at the level of efficiency established by Hospital D and A, respectively. Column D shows, when compared to the Patient Care "Estimate," the potential savings for each hospital which would result from treating its case-mix at the level of efficiency established by taking the lowest cost across eighteen hospitals for each DRG in which a hospital treats at least ten patients.

unrealistic to assume that these are no practical barriers, such as age and design of the physical facility, which would prevent anv one of eighteen hospitals from achieving this level of efficiency. Furthermore, no assessment of the quality of medical care being provided bv the lower cost vs the higher cost hospitals has yet been attempted.[10] However, if it can be demonstrated that an equivalent quality of medical care is being provided across the institutions, then the above cost savings provide a goal which can be pursued. At the very least, the figure does indicate that there is money in the system which can be saved. Thus, as a standard of cost performance is established, it becomes increasingly important that both the regulator and industry establish yardsticks, such as this, by which to closely monitor the progress of both individual institutions, and of the system as a whole. When the mean is selected as the standard, larger potential exists for the industry to articially inflate that standard, and, for all intents and purposes, monitor itself. Its use is intended, however as incentive reimbursement which implies the shift in responsibility from regulator to hospital previously discussed in the content of S.446 section I.A. It implies the responsible and effective use of the valuable management information provided by this system, to minimize cost (S.446, section 1) as a means to maximize payment in the public interest rather than to maximize costs in order to maximize payment.

Progress must be measured at both the institutional and system

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[10] The New Jersey State Department of Health, the federal government through its PSRO and HSA agencies, and the hospitals themselves have in existence programs to monitor and assess the quality of medical care being provided.

level to confirm whether or not the hospital industry can respond to incentives or identify any potential need for changes in the standard, or the rate period, and to determine future changes in the rate proportions which will be required to reach the Certified Revenue Base. The same numbers will be important in helping "to take into account the effectiveness and efficiency of the health care delivery system as a whole," as appeals to adjust the Certified Revenue Base for issues which "may affect one or more hospitals" are undertaken pursuant to S.446, section 11c. Working with the industry to understand both the potential and the limitations of these numbers, so that fair and reasonable yardsticks may be established, is the next great task of this experiment.

E. Timetable

Following a period of time to allow digestion of the material which follows, we look forward to several meetings prior to January during which we can receive your comments and criticism on the simulation and, also, resolve the balance of the problems were presented earlier concerning payor issues, etc. As noted, the Second Annual Report, due later this Fall, will contain the tables needed to consider the problem of standards and goals. It will also contain a preliminary draft of a user's manual, a volume specifically designed to provide practical assistance to the hospital on "how to cope." We are aware that this system impacts on areas of your institution well beyond the financial staff. Thus, for example, we are formulating a payment section designed to help coordinate billing and medical records with respect to major diagnosis consistency, price list, outliers, split benefits, timetables and so forth. We look for your early input and assistance in the development of this manual.

The Second Annual Report will also discuss a number of options for dealing with the split payor issue. This problem is analogous to the problem of the outlier and the self-pay; in all three cases, a mechanism is needed to resolve the unique problems of the individual case. The simplest solution would be a DRG per diem, however, this approach may establish unfortunate incentives toward extending length of stay. Another alternative is to rely on the charge structure. However, as both the hospitals and the New Jersey Hospital Association have argued, <u>current</u> charge structures in New Jersey are so chaotic that their value, even on an aggregate basis as a statistic for apportionment, was vigorously questioned. Exploring several balanced options in the

context of the split benefit problem will provide an early head start on solving the core problem well in advance of any implementation beyond Blue Cross subscribers.

The Second Annual Report will also bring you current on any other developments which may affect the six month rate proposed for January 1979. Changes currently anticipated including reAUTOGRPing, revised nursing weights, equalization, and economic factor, are outlined in the section on Future Developments. This section represents our continuing commitment to improve the system, to keep it current, and to keep you informed well in advance. Thus, the Annual will contain data on the results achieved in the reAUTOGRPing process to obtain equity in the transfer of patients situation to produce greater DRG homogeneity, reduce variance, and so forth. Also covered will be the actual interim modification which will be used during the contract period to arrive at a per case rate for Blue Cross patients only, and areas designated for future research under the implementation contract such as sampling and goals.

The simulation presented in this report has been discussed in the context of S.446 and the Commission. However, prior to mid-year 1979, we must deal with the contract that was formulated over two years ago. Although the contract represented a sincere good faith effort by all parties to predict the future, the subject matter was an experiment not a bargained forexchange of commodities. Through endless hours of committee discussion, we exchanged views on each new topic - prospectivity, incentives, rate design - and, together, gave shape to the simulation which appears in this report. We hope that this evolution

can proceed to a modification which will provide an accurate six month replica of the payment process which may be implemented by the Commission. On the other hand, the immediate concern is with a unique period of time during which, among other things, the system will be operated for Blue Cross only and will be available as an option for eighteen self-selected institutions. Thus, for example, the net payout will vary depending on whether or not all hospitals take the option, just winners, or some group in between. After studying this material, it would be appropriate for the hospitals to propose an equitable set of proportions or system for developing such a set which, under these circumstances, would help define the term "DRG budget," as a first step in the negotiation.

II. PATIENT CLASSIFICATION: THE DRGs

II. Patient Classification: The DRGs

The building blocks of the case-mix reimbursement system are Diagnosis Related Groups, or DRGs. DRGs are patient groupings designed to be both medically meaningful and similar in hospital resource consumption (measured by patient days or dollars).

The development of DRGs was undertaken during the winter of 1976-77. The collection of medical abstracts (See III.A.2.a.) for each discharge and their formation into Diagnosis Related Groups for all hospitals in the state was termed "New Jersey Experiment II or NJ." Utilizing five independent or predictor variables (a sixth, clinical service, was used in only one instance.) namely, primary diagnosis, secondary diagnosis, principle operative procedure, second operative procedure and age, patient differences in length of stay were analyzed within 83 Major Diagnostic Categories (MDCs broad groupings of medical diagnoses of a specific type and/or referrable to specific body systems) of patient discharges across all New Jersey hospitals. This process resulted in the classification of 383 Diagnosis Related Groups which accounts for all diagnoses and inpatients. The groups are highly predictive of length of stay given the diversity of hospitals from which the data base was drawn with the exception of a relatively small (1.8% for 1976) group of extremely long length of stay patients termed "outliers" (See Section IV.D.2).

The list on pages 13-30 presents the 383 DRGs by number and English description, together with 1976 equalized standard costs per case across the Experiment hospitals. The English descriptors are not meant to be entirely

definitive for all patients within a DRG, rather they represent those descriptors which encompass the largest portion of patients within a DRG in order to achieve a balance of understandability for physicians, administrators, nurses, and other hospital and hospital related personnel. Complete breakdowns of the composition of each DRG by specific diagnostic and operative codes (in terms of both major classification of diseases coding schemes currently used in America, ICDA-8 and HICDA-2) and age ranges are contained in the Appendix of the First Quarter Report and the Appendix of the Second Quarter Report. Branching diagrams of the DRGs together with the codes and definitions of the most frequently occurring diagnoses and operative procedures used to classify the DRGs are found in AUTOGRP Patient Classification Scheme for Length of Stay available from the Department of Health.

III. HOSPITAL COSTS

1. Hospital Cost Data

a. Input Cost Data

In order to identify hospital costs by patient case-mix and to compare these costs across hospitals it is necessary to receive uniform functional cost reports from hospitals. The functional hospital reporting system from which most of the cost data utilized to determine costs per case is obtained from the Standard Hospital Accounting and Rate Evaluation (SHARE) System established by the New Jersey Department of Health and Insurance for New Jersey hospitals under Chapter 136, NJSA 26:2H-1 et seq. These costs are collected by a uniform set of functional cost centers for all New Jersey acute and rehabilitative care hospitals and are grouped into three cost clusters: patient care services (i.e., nursing), ancillary services, and general services and are collected for the previous year's actual costs. The SHARE cost data used throughout the DRG Cost Model,[11] as well as any supplemental data that might have been required, are actual data, as opposed to projected or budgeted. (I.e., for 1978 case-mix reimbusement rates 1976 SHARE actual cost data were used.) The SHARE cost centers that are case-mix or DRG related[12] are:

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[11] The DRG Cost Model is a mathematical and statistical representation of a hospital's operations over a given time period with regard to the provision of those services as measured in terms of resource (dollar) application between inputs (i.e,, cost center expenses) and outputs (i.e., patients treated).

[12] Patient Care or DRG related costs represent only the direct costs of ancillary services, nursing, and patient care general services. Institutional or overhead costs are treated separately and are discussed in Section III.B. pp. 144-8. For definitions of the DRG related cost centers refer to the SHARE manual, Section. B.

TABLE VI PATIENT CARE COST CENTERS

NURSING SERVICES [13]	
Registered Nursing Services	RNS
Licensed Practical Nursing Services	LPN
Nursing Attendants	ATT
Unit Clerical Services	CLR
ANCILLARY SERVICES	
Blood Bank	BBK
Cardiac Catheterization	CCA
Delivery and Labor Rooms	DEL
Dialysis	DIA
Electrodiagnosis	EDG
Laboratory	LAB
Nuclear Medicine	NMD
Operating and Recovery Rooms	ORR
Other Physical Medicine	OPM
Pharmacy	PHM
Physical Therapy	PHT
Radiology	RAD
Respiratory Therapy	RSP
Therapeutic Radiology	THR

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[13] Currently classified by the SHARE rate setting system as:

Acute Care Units	ACU
Intensive Care Units	ICU
Newborn Nursery	NBN
Sub-Acute Care Units	SAC
Nursing Administration	NAD

PATIENT CARE GENERAL SERVICES

Dietary Services	DTY
Housekeeping[14]	HKP
Laundry and Linen[14]	L&L
Medical Records	MRD

The costs within each of the above cost centers are reported for the following elements of cost:[15]

Employee Salaries

Physician Salaries

Physician Fees

Supplies

Contracted Services

Other Expenses

Depreciation and Facility Interest

Lease Cost

Expense Recovery

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[14] Patient care portion only, as discussed in Section III.A.1.d. below.

[15] For definitions of these items refer to the SHARE Manual, Section B.

b. Recasts and Reclassifications

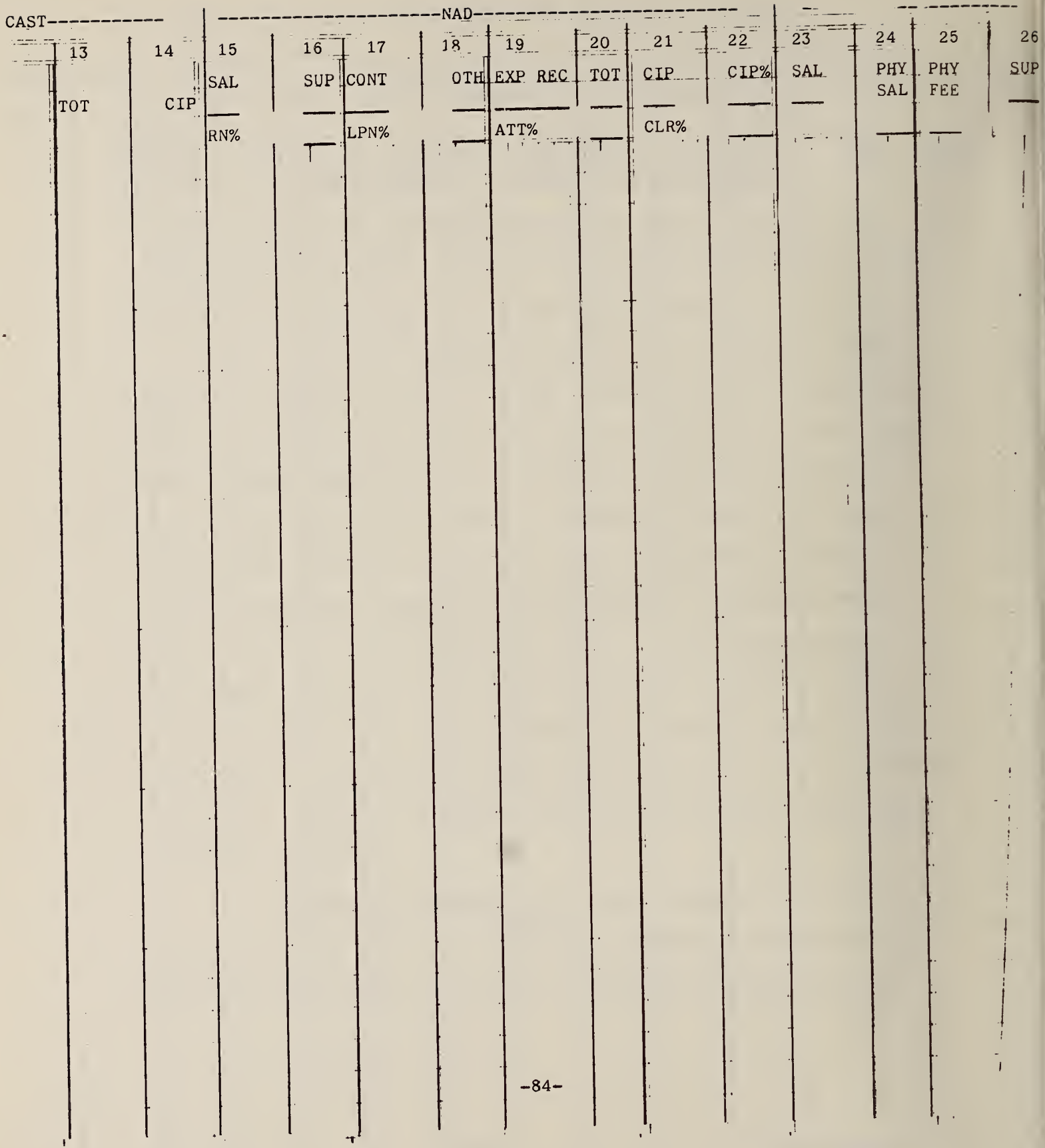
The cost information is transcribed from the appropriate SHARE forms and reorganized into a format amenable to the case-mix model. For example, the Depreciation and Facility Interest and Lease Costs reported in each cost center are combined into one column since these two elements of cost are treated equivalently throughout the DRG Cost Model. Model Run Table 1, "Initial Cost by Elements of Cost," the first page of the DRG Cost Model, displays the modified format that is used for cost input.

The classification of hospital costs employed by the DRG Cost Model includes a refinement of SHARE's taxonomy of ancillary service, patient care service, and patient care general service cost centers. This reclassification was accomplished by obtaining supplemental information from each of the Participating Hospitals in order to eliminate any ambiguities that might exist in a hospital's reporting of costs through SHARE. Figure 4 Cost Recast Worksheet, columns 1-10 shows a hospital's costs by element of cost, in total, and Covered Inpatient (CIP), as they were originally reported for cost centers to be included in the DRG Cost Model on SHARE 1976 actual Forms C and F. This Worksheet was completed for each Participating Hospital. The follcwing modifications have been made to the original cost information in order to facilitate patient cost, rather than cost center comparisons:

1. Allocation of Nursing Costs: Costs reported in the Acute Care Units (ACU), Sub-Acute Care Units (SAC), Intensive Care Units (ICU), and Newborn Nursery (NBN) cost centers were combined for each element of

FIGURE 4: COST RECAST WORKSHEETS

	ORIGINAL REPORTED										HK	
	1	2	3	4	5	6	7	8	9	10	11	12
CENTER	SAL	PHY SAL	PHY FEE	SUP	CONT SER	OTH	DEP LEASE	EXP REC	TOT	CIP	SAL	SU
HKP												
LSL												
CSS												
BBK												
DEL												
DIA												
EDG												
LAB												
ORR												
OPM												
PHM												
EPHT												
RAD												
RSP												
CCA												
NURSING%												
RNS												
LPN												
ATT												
CLR												
DTY												
MRD												
NMD												
THR												
ANS												
EMR												
INSTITUTIONAL(NON-CIP)												


CAST
NAD
13
TOT
14
CIP
15
SAL
RN%
16
SUP
17
CONT
LPN%
18
OTH
19
EXP REC
ATT%
20
TOT
21
CIP
CLR%
22
CIP%
23
SAL
24
PHY SAL
25
PHY FEE
26
SUP

--------OAS----------						DTY EXP. REC. ADJUSTMENTS	-------CSS SUPPLY RECAST---		PACEMAKER
27	28	29	30	31	32	33	34	35	36
CONT. SER.	OTH	DEP LEASE	EXP REC.	TOT	CIP	TOT	TOT	CIP	TOT

FINAL

37	38	39	40	41	42	43	44	45	46	47	
	PHY	PHY		CONT.		DEP	EXP			INPATIENT	
SAL	SAL	FEE	SUP	SER.	OTH	LEASE	REC	TOT	CIP	%	CENTERS
											HKP
											L&L
											CSS
											BBK
											DEL
											DIA
											EDG
											LAB
											ORR
											OPM
											PHM
											PHT
											RAD
											RSP
											CCA
											NURSING
											RNS
											LPN
											ATT
											CLR
											DTY
											MRD
											NMD
											THR
											ANS
											EMR
											INSTITUTIONAL (NON-CIP)

cost to determine total nursing costs for a hospital (Figure 4, line 18). These costs were reclassified into four nursing skill levels - Registered Nursing (RNS), Licensed Practical Nursing (LPN), Attendants (ATT) and Unit Clerical Services (CLR) (Figure 4, lines 19-22). In order to determine the percentage of costs attributable to each skill level, total salary information by skill level within the various nursing units was provided to the Project by the Participating Hospitals. (This information is now submitted to SHARE on Form C-6.)

2. Housekeeping Recast: Housekeeping costs reported in the Operating and Recovery Rooms (ORR), Delivery and Labor Rooms (DEL), and Newborn Nursery (NBN) cost centers per SHARE definitions were recast from these centers to the Housekeeping (HKP) cost center in order to make the definition of Housekeeping more consistent with hospital responsibility centers and more functionally consistent with the general activities of these four centers. This recast was based upon actual costs for supplies and salaries submitted by Participating Hospitals to the Project. This procedure was recorded on Figure4 columns 11-14 as a debit to HKP and credits to ORR, DEL, and Nursing/ATT (See Section III.A.2).

3. Allocation of Nursing Administration Costs: The Nursing Administration (NAD) cost center was eliminated and costs reported in this center were allocated to nursing and ancillary centers. This allocation was necessitated by the inability of the functional reporting center to account for these costs consistently across hospitals. This procedure was based upon hospitals' Medicare Worksheet B-1 Stepdowns (See Section III.A.1.d.) as well as using information provided by the hospital (See item 1)

regarding the nursing skill levels of personnel in this center. The reported costs of NAD and percentage by skill level are shown in the heading to Figure 4 columns 15-22 and debits are shown for the appropriate cost center lines in these columns.

4. Other Ancillary Services Allocation: The Other Ancillary Services (OAS) cost center utilized by SHARE for 1976 costs, a cost center used for services that did not conform to the specific ancillary service definitions or for services not specified elsewhere, was eliminated. Its costs were allocated to the appropriate ancillary cost center(s) in order to achieve greater functional clarity and consistency in cost to charge ratio for DRG cost allocation (See Section III.A.3.c.) This allocation was based on an actual cost breakdown of this cost center provided to the Project by each Participating Hospital for the service included in OAS. The SHARE reported costs of OAS are shown in the heading to columns 23-32 of Figure 4 and debits are recorded in these columns for the appropriate cost center lines. In addition any recasting of costs between ancillary centers to reflect charge reporting discrepancies from uniform functional definitions for hospitals where charge reporting could not be corrected (See Section III.A.2.b.2.) are shown as debits and credits in these columns.

5. Creation of Cardiac Catheterization Center: A new cost center was created for Cardiac Catheterization (CCA) costs, the only other ancillary service which could not be easily classified by better interpreting or broadening definitions of the remaining ancillary service centers. These costs are shown on line 17 of Figure 4 columns 23-32.

6. Dietary Adjustment: A credit to the Dietary (DTY) cost center in expense recovery (Figure 4 column 33) was made in order to reflect the value of free meals served to students, employees, and/or others. Policy Fringe Benefits (and hence the fringe factor - See Section III.A.1.b. below) and the Institutional Cost centers, Administration and General (A & G), and Education and Research (EDR) are debited. This procedure is identical to that presently being used in the calculation of SHARE rates. (Refer to SHARE Manual, p. F-4.)

7. Supply Costs Transfer: In order to compare hospitals' medical and surgical supply costs the SHARE system allows hospitals the option of reporting these supply costs in the CSS center or in the utilizing nursing or ancillary cost centers, but then transfers all supply costs in such centers to CSS. Starting with SHARE costs and hence reporting options, the DRG Cost Model requires the transfer to CSS of supply costs reported in centers where a majority of supplies may be consumed directly by patients - Operating and Recovery Rooms (ORR), Anesthesiology (ANS), Delivery and Labor Rooms (DEL), Physical Therapy (PHT), Cardiac Catheterization (CCA), Acute Care Units (ACU), Sub-Acute Care Units (SAC), Intensive Care Units (ICU), and Newborn Nursery (NBN). In order to identify supply consumption by patient, supply costs had to be aligned with hospital charging structures and allocated either through medical-surgical supply charges, ancillary service departmental charges, or per diem within patient care units for floor stock (See Section III.A.2.b.2.). This transfer procedure varied from hospital to hospital due to differing reporting methods used to report the costs of supplies, labor, associated processing costs and differing methods used to allocate these costs to con-

suming departments. (See Section III.A.1.d. and Sixth Quarter Report section II.B.) It proved necessary to contact each hospital to determine the need for performing the supply costs transfer. The transfer was required for eight hospitals, for another eight only nursing units and floor stock were required, and a partial transfer was required for two hospitals. In addition, due to options in the reporting procedures allowed under SHARE, it was necessary to determine for each hospital whether the supplies reported in the Emergency Room (EMR) cost center reflected all the supplies consumed by emergency room admissions or whether some supplies were reported in the CSS cost center. In order to determine a hospital's EMR supplies appropriately it was necessary in some cases to also transfer these supply costs to CSS. The supplies transfer is shown on Figure 4 columns 34-35 as a debit to CSS and credits to nursing and (sometimes) ancillary centers and (sometimes) EMR.

8. Pacemaker Costs: Actual pacemaker costs were obtained from hospitals and included in the DRG Cost Model in the ORR cost center. (Debit to Figure 4 column 36 line 11.) These costs are only reported to SHARE in Budget and Projected cost submissions and were not previously required in SHARE Actual cost reports. (Refer to SHARE Manual, Section E, Form C-4.) Although not covered directly by the current New Jersey Blue Cross contract, pacemakers are a direct patient treatment expense which is allocated to the DRGs, but are later removed for New Jersey Blue Cross reimbursement purposes. (See Section III.D.)

After the above adjustments are made for each hospital, costs are added across the Figure 4 Cost Recast Worksheet and recorded in columns 37-46. These costs are then in a format needed for input to the DRG Cost Model and are entered as such on Table 1 of the Model Run, "Initial Costs by Element of Cost."

The total line of Table 1 of the DRG Cost Model is desk checked against the original SHARE actual submission. These totals should agree, by element of cost, with the total of the SHARE inpatient cost centers ACU, ICU, NBN, and SAC, ancillaries MRD, DTY, HKP, NAD, and L&L, less DTY adjustment plus CIP and EMR supplies, where transferred, and pacemakers.

Fringe Factor

Fringe benefit costs are reported in three SHARE cost centers -Legal Fringe Benefits (LFB), Policy Fringe Benefits (PFB) and Pensions (PEN). (Refer to SHARE Manual Section B, pp. 73-74.) To these direct fringes the imputed costs for subsidized employee meals and hospital self insurance coverage for its employees are added. Rather than receiving a direct accounting of fringe benefits by cost center, total fringes are apportioned among all cost centers by each center's proportion of total salaries by multiplying non-physician and physician salaries by a hospital's ratio of total fringe benefits to total salaries (the fringe factor). These costs may be identified separately from direct costs throughout the DRG cost finding methodology. For purposes of reimbursement these costs are included as part of the DRG related costs by cost center; however, for purposes such as developing a hospital's operating budget by cost center, fringes may be separated from direct salaries. Fringed costs are currently used in the Management Reports (See Section V.) For the actual calculation of the fringe factor, refer to the SHARE Manual, sections F, p. 6 and E, Form C-2. Each hospital's fringe factor and its application to the Model input data is shown on Table 2 of the Model Run, "Initial Cost Adjusted for Fringe Benefits by Element of Cost for Each Cost Center."

Apportionment of Expense Recovery

Expense recoveries (i.e., revenues generated by a cost center other than through patient care reimbursement) are applied proportionately to reduce the costs of a cost center within each element of cost.[16] This apportionment is based upon the actual amount of cost reported in each element of cost for the particular cost center. For example, if a hospital reported $10,000 in expense recovery for dietary services generated through cafeteria revenue to be applied against $100,000 in direct dietary expenses, $60,000 in labor and $40,000 in supplies, the amounts to be included in the DRG Cost Model would be $90,000 total dietary expenses, composed of $54,000 in labor and $36,000 in supplies. The apportionment of expense recovery is needed to complete a hospital-specific economic factor during the prospective rate-setting process (See Section IV.B.). The apportionment of expenses recovery is shown on Table 3 of the Model Run.

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[16] The SHARE system presently only reduces the total cost for the center and makes no adjustments to the elements of cost.

Transfer of Ancillary Physician Costs

Currently the Department of Health's rate-setting authority applies only to health care facilities costs which include the costs of services of physicians compensated through a health care facility. Because of varying physician compensation arrangements with hospitals, cost reporting for physicians,who by the nature of their practice are necessarily hospital based (e.g., anesthesiologists, radiologists, nuclear medicine, etc.), varies considerably by hospital. In order to preserve uniformity of cost comparisons by DRG across hospitals, ancillary physician costs (except pathologists' costs) are not included in the DRG Cost Model's definition of Hospital Costs, but are removed from ancillary service cost centers, and treated as a Hospital Cost Adjustment (See section III.D.) Pathologists, who are uniformly compensated through hospitals in New Jersey, are the only exception to this rule. Therefore, physician salaries and fees are included in the cost centers of Laboratory and Blood Bank, but in all other ancillary service centers physician costs are transferred to the created cost center Ancillary Physicians (APH) as shown on Table 6 of the Model Run. Anesthesiology contractual arrangements with hospitals show the greatest variation hospital-to-hospital, because some anesthesiologists bill separately their own services, as well as services of nurse anesthetists. All anesthesiology expenses except supplies are excluded from DRG costs and treated as a Hospital Cost Adjustment (See Section III.D).

c. Separation of Inpatient and Outpatient Costs

Since the DRGs reflect only the delivery of inpatient services, the direct and overhead costs of patient care services delivered to outpatients must be distinguished from inpatient costs. This separation is accomplished by applying an inpatient ratio to the total costs of each cost center. Currently the DRG Cost Model's inpatient ratios are taken from the SHARE system with minor modifications as discussed below. As with most cost finding methodologies, the SHARE system relies largely on a charge based apportionment (Ratio of Charges to Charges Applied to Costs) of costs between inpatients and outpatients.

The 1976 SHARE Actual Form F, Direct Allocation of Cost (See SHARE Manual, section E, Form F.) allocates total costs by cost center into Covered (by New Jersey Blue Cross's contract with hospitals) Inpatient (CIP), Emergency Room, Clinics and Private Outpatient, and Non-Eligible (by reimbursement principles of the current New Jersey Blue Cross contract) costs. By definition, costs for patient care unit (nursing) costs are entirely inpatient. Inpatient ratios are determined for ancillary centers by the ratio of inpatient revenues to total revenues by cost center. (See SHARE Manual, section E, form E-1). For most indirect (i.e., other non-revenue generating centers such as Housekeeping or Laundry and Linen) centers, inpatient costs are determined by a partial step-down to nursing centers (where the resultant amounts are 100% inpatient) or ancillary service centers (where the stepped down amounts are divided between in-patient and outpatient based on charges per group of ancillary centers) by one of five means of statistical apportionment (total expenses, laundry

and linen pounds, housekeeping "units", which are defined as hospital plant square feet, and total salaries). (See SHARE Manual, section E, form E-2). This partial stepdown does not account for the provision of services by any general service center to any other general service center. Furthermore, a hospital's rate is not bound by SHARE's CIP cost determination since New Jersey Blue Cross allows a number of options in its own cost finding, and differences from SHARE's CIP determination in a hospital's favor are treated as an Add-on Costing Differential to a hospital's Blue Cross rate. (See Hospital and Payor Cost Adjustments, Section III.D.). For a few centers, direct costing is required.

Patient services, not included in the basic contract between New Jersey hospitals and New Jersey Blue Cross, are included in the DRG Cost Model (i.e., Therapeutic Radiology (THR), Nuclear Medicine (NMD) and pacemakers) and are allocated to the DRGs to provide a full picture of hospital resources consumed by patient for DRG payment determination. These inclusions allow more fair comparisons among hospitals to be made where trade-offs exist among patient treatment patterns (i.e., substitutability of Non-Eligible Therapeutic Radiology and Covered Inpatient Chemotherapy (Pharmacy) resources). Such costs may be eliminated from the Patient Care Costs portion of Hospital Costs for New Jersey Blue Cross reimbursement as a Payor Cost Adjustment (See Section III.D.). Since THR and NMD costs are not reimbursed as part of the Blue Cross rate, the inpatient portion of these costs may not be reported to SHARE Inpatient costs for these centers are reported on SHARE form F as Non-Eligible. Where a portion of these costs were reported on the F form as Emergency Room or Clinics and Private Outpatient, the Non-Eligible portion was assured to be Inpatient. However, where these centers were

reported as 100% Non-Eligible it was necessary to obtain the inpatient ratio for these centers from Medicare's Worksheet C, provided to the Project by Participating Hospitals. Pacemakers were assumed to be 100% Inpatient.

The procedure for determining the inpatient ratios of total costs from SHARE (and in some cases Medicare) cost findings is modified for some centers in order to reflect the effects of the cost recasts and reclassifications discussed in section III.A.1.b. above. Where costs are reclassified from one cost center (e.g., Nursing Administration) with a certain inpatient ratio to a second cost center with a different inpatient ratio, the inpatient ratio of the second center will necessarily be affected and appropriate adjustments will be made. Figure 4 , "Cost Recast Worksheet," shows initially reported total costs and inpatient costs for each center in columns 9 and 10 and finish total costs, inpatient costs, and recomputed inpatient ratios for each center in columns 45 and 46. Adjustments which affect a center's inpatient ratio occur for:

1. The HKP cost center in order to reflect the transfer of costs from the ORR, DEL, and NBN cost centers (Figure 4,columns 13 and 14)

2. Those centers to which OAS costs are allocated (Figure 4, columns 31 and 32)

3. The CSS cost center due to the transfer of supply costs from other centers (Figure 4, columns 34 and 35)

4. The ORR cost center in order to reflect the addition of pacemaker costs (assumed to be 100% inpatient) to this center (Figure 4, column 36).

The adjusted inpatient ratio is calculated by: (a) adding the

total cost transferred to a particular center to the total costs already reported in the center (after any deductions from the center's costs due to other reclassifications); (b) taking the inpatient portion of each cost transferred and adding these costs to the inpatient costs already reported in the center (also after deductions); (c) dividing the new inpatient costs for the center by the new total costs for the center after all adjustments to determine the center's final inpatient ratio. Table 4 of the Model Run presents these final inpatient ratios for each cost center. The cost center inpatient ratios are applied to Model Run Table 3, "Initial Costs Adjusted For Fringe Benefits and Expense Recovery Apportionment by Element of Cost" for each Cost Center (before moving ancillary physician costs to APH in the Model Run) to produce Model Run Table 5, "Inpatient Costs by Element of Cost" for each cost center.

d. Allocation of Cost Centers to Allocation Centers

The cost centers Housekeeping (HKP), Laundry and Linen (L&L) and Central and Sterile Supply (CSS), while largely providing patient care related services which may fluctuate with case-mix, do so through their utilization by other cost centers, specifically the ancillary services and nursing units. If an accurate identification of resources consumed by each patient is to be achieved, these "overhead" patient care costs should be included in the costs allocated to patients even though direct charges do not exist for HKP, L&L and floor stock supplies. This is accomplished on the basis of the patients' utilization of the non-overhead DRG related cost centers through patients' consumption of Measures of Resource Use (See Section III.A.2.b.) once these servicing cost centers have been allocated to all other cost centers, including those more readily associated with DRGs. This allocation is based upon statistics from 1976 Medicare Cost Finding Worksheet B-1, provided by each Participating Hospital

Because the Medicare stepdown lists a larger number of benefiting cost centers than are contained in the SHARE system and hence the DRG Cost Model, the statistics for several cost centers are combined and rearranged in order to match SHARE cost center definitions. For example, Electrocardiology and Electroencephalography are listed separately in the Medicare stepdown, but are combined for the DRG Cost Model allocation of these cost centers to the allocation centers from which costs are allocated to DRGs. The melding of Medicare centers and statistics with the SHARE based DRG Cost Model cost and allocation centers is recorded on page 2 of Figure 5, "Allocation Statistics Worksheet."

FIGURE 5

ALLOCATION STATISTICS WORKSHEET

	1	2	3	4	5
	IP %	DEP SQ FT	G.S. HKP STAT	% TOT COST	NAD STAT / ADDED	RPTD STAT	CCA/ORR COST / ADJ	HKP STAT
A&G	A&G			CSS				
MAINT & REP	PLT			DEL				
OPER of PLT	PLT			ORR				
L&L	L&L			RSP				
HKP	HKP			CCA				
DTY	DTY							
Cafeteria	0							
MAINT of PERS	OGS							
NAD	Distributed							
CSS	CSS			NURSING				
PHM	PHM			ACU				
MRD	MRD			ICU				
SOC SER	PCC			NBN				
NURSG SCHOOL	0							
INT/RSD	RSD			EMR				
				CLN				
				Schoolof Nursing				
TOTAL								
RATIO	HKP / DEP Sq. Ft.							

	HOSPITAL	HKP	L&L
HKP			
L&L			
CSS			
BBK			
DEL			
DIA			
EDG			
LAB			
ORR			
OPM			
PHM			
PHT			
RAD			
RSP			
CCA			
DTY			
MRD			
NMD			
THR			
NSG			
ACU			
ICU			
NBN			
PHY			
RSD			
ADM			
MAI			
OPP			
MofP			
SOC			
SCH of N			
SNF cert			
SNF un			
CLN			
EMR			
HHS			
AMB			
MIS			

In the Medicare stepdown HKP statistics, like CSS and L&L statistics, are usually applied in a single stepdown process, thus Housekeeping costs are only allocated to cost centers listed below HKP in the stepdown. Conversely, no HKP costs are allocated to HKP itself, L&L, Operation of Plant, Maintenance and Repairs, and Administration and General, although Housekeeping certainly provides services to these centers.

To achieve a more accurate allocation of HKP costs the DRG methodology first estimates the proportion of HKP costs that are consumed by HKP itself and the other general service centers listed above HKP on Medicare's B-1. This is accomplished in the following manner:

1. Housekeeping statistics for the general service cost centers - Dietary, Cafeteria, Maintenance of Personnel, Nursing Administration, Central Service and Supply, Pharmacy, Medical Records and Library, Social Service, Nursing School, and Intern-Resident Service are recorded on lines 6-15 of the "Allocation Statistics Worksheet," Figure 5, page 100 under the "G.S. HKP STAT" column and totaled on line 20.

2. Building square feet for the above cost centers, obtained from the Buildings and Grounds Depreciation column on Medicare Worksheet B-1, are totaled and recorded on the same lines of Figure 5 under the "DEP SQ. FT." column.

3. The total of Housekeeping Statistics for the General Service cost centers is divided by the total of Depreciation square feet to arrive at an average ratio of Housekeeping hours of service to building square feet for general service cost centers recorded on line 20 of page 1 of Figure 5. Centers with no Housekeeping statistics were eliminated from the computation of this ratio.

4. Since building square feet is known for these general services for which Housekeeping hours of service are unknown, (the Housekeeping,

Laundry and Linen, Operation of Plant, Maintenance and Repairs, and Administration and General cost centers) the ratio derived in step (3) is applied to the building square feet for these cost centers recorded on lines 1-5 of Figure 5 to arrive at the approximate number of Housekeeping hours of service these centers consume (recorded on these same lines under the "G.S. HKP STAT" column and then transferred to the HKP column of page 2 of Figure 5 for these centers). Where an extremely large number of Operation of Plant square feet was encountered (i.e., footage unallocated through a square footage study) alternate Medicare data were used to estimate housekeeping for the Plant office and work areas.

Further adjustments to derive statistics are made where reclassifications, discussed in Section III.A.1.b. above, are involved. Thus, the CSS, HKP,and L&L statistics for Nursing Administration are spread to those centers where NAD was apportioned and added to the originally reported statistics in those centers (See Figure 5, page 1). Where Cardiac Catheterization costs were reported in OAS for SHARE, but were combined with Operating Room for Medicare, statistics were apportioned between CCA and ORR based on a ratio of costs to costs (See Figure 5, page 1). All such adjustments were added to the statistics on Figure 5 , page 2.

As discussed in the Supply Costs Transfer portion of Section III.A.1.b. the method of apportionment of medical/surgical supply costs to patients through allocation centers varied by hospital reporting practices. For a hospital with no reporting peculiarities supply costs may be initially reported on the nursing units in the ORR and DEL areas, or may be reported in the CSS center from which they were originally issued. The Supply Costs transfer

moves all these supply costs back to CSS from which they are to be spread, together with CSS labor and processing costs, back to their consuming centers or a center created for med/surg supplies charged directly to patients (MSS) based on costed requisitions of supplies from CSS.

However, for some hospitals the Medicare statistics corresponded only to those costs initially reported in CSS for SHARE. Supplies in the other affected cost centers belong where they were initially reported. Such hospitals, therefore, had no supplies transferred to CSS with the exception of floor stock. Since nursing units (i.e., ACU, ICU, NBN) are not used as cost centers in the DRG Cost Model, but are used as allocation centers, floor stock is transferred to CSS and additional statistics imputed and added to the costed requisitions already reported in ACU, ICU, and NBN such that the transferred costs are returned to the floors from which they were originally transferred. Figure 6, "CSS Statistics Worksheet," was completed for those hospitals without a supplies transfer, except floor stock.

Finally, some hospitals reported 100% of their CSS costed requisitions going to medical-surgical supplies charged to patients. (Supplies had been recast to nursing units and ancillary centers before the Medicare cost-finding.) In such instances, a supply cost transfer was performed and the dollars transferred used as the "statistic" for CSS allocation.

Since cost finding for inpatient versus outpatient expenses has already been undertaken at the time of the cost center allocation to allocation centers in order for the inpatient costs of the DRG Cost Model to agree with SHARE"s CIP costs, only inpatient costs are used in the stepdown. In order to spread inpatient overhead, each allocation statistic for each cost center was multiplied by the appropriate inpatient ratio for

FIGURE 6

CSS STATISTICS

I.

	A. Nursing Supply Costs	B. Total CSS Costs	C. New Total CSS Costs	D. Total CSS Medicare Statistics	E. (C + B) x D New CSS Medicare Statistics	F. (E - D) Imputed Statistics for Floor Stock
ACU		_____	_____	_____	_____	_____
ICU		_____	_____	_____	_____	_____
NBN		_____	_____	_____	_____	_____
TOTAL	[ ]	+ [ ]	= [ ]	[ ]	[ ]	[ ]

II.

	Imputed Statistics		Original Medicare Statistics		Revised Statistics
ACU Imputed ($A + A_{TOT} = ? + F$)	[ ]	+	[ ]	=	[ ]
ICU Imputed ($A + A_{TOT} = ? + F$)	[ ]	+	[ ]	=	[ ]
NBN Imputed ($A + A_{TOT} = ? + F$)	[ ]	+	[ ]	=	[ ]

III.

Original CSS Ratio [ ] becomes MSS Ratio

Revised CSS Ratio [ ]

the allocation or benefiting cost center. Table 7 of the Model Run presents, in Section III.A.1.c., the allocation statistics for HKP, L&L, and CSS and each benefiting allocation center's inpatient ratio.

Once these steps have been completed to align Medicare's stepdown statistics and costs with the inpatient costs grouped in the DRG Cost Model's format, costs are allocated via a process which is equivalent to an infinite stepdown (a multiple stepdown carried out until all overhead centers are reduced to zero, even where the cost centers being allocated, provides services to one another and themselves). The identity of an allocated cost center's costs is retained throughout the process (i.e., while Housekeeping is distributed among other centers for patient apportionment purposes, its cost are not treated as indirect expenses of the benefiting centers, but rather the components of Housekeeping are reaggregated by patient and DRG once the DRG Cost Model has run its course.) Model Run Table 8 presents the results of the allocation process in terms of the percent of inpatient cost from a cost center. Table 9 of the Model Run presents allocated costs to an allocation center.

Some portions of HKP and L&L are allocated to non-DRG related centers and are input to the Institutional Cost Methodology (See Section III.B.) and some portions of CSS may be allocated to the CIP portion of the Emergency Room (CIP Emergency Room supplies and services are addressed in Section III.D. below as a Payor Adjustment to hospital costs.)

The twenty-five allocation centers (each prefixed by the letter "C" to distinguish them from cost centers) are the classifications of DRG related costs after the allocation and are the centers from which costs are associated

with Measures of Resource Use (See Section III.A.2.b. below) and distributed to DRGs. Each allocation center is a "holding bucket" composed of varying proportions of the twenty-three cost centers input to the model with the non-DRG related portions removed from the three cost centers which were allocated. Table 10 of the Model Run presents this view of the allocation centers,"Percent of Inpatient Cost of an Allocation Center" originating in a cost center, the opposite perspective from which traditional stepdown procedures are usually viewed.

III. A. PATIENT CARE COSTS
2. Patient Data

a. Medical Abstracts

The medical abstract contains the raw information required to classify patients into Diagnostic Related Groups and some additional information used in the cost allocation process. In order to use the DRG case-mix approach, there must be data available on all patients of interest or a statistically valid sample thereof. (Currently 100% of discharge abstracts are used in the cost allocation process.) The data base used by the Department consists of abstracted medical record information for each patient discharged by an acute care hospital in New Jersey since January 1, 1976. State regulation requires that the abstracting program chosen by the hospital contain at a minimum the data items provided by the New Jersey Hospital Utilization Program (the mimimum data set items are listed below with their corresponding uses) and that the abstracts be submitted to the Department of Health on a quarterly basis. (For the text of these regulations as published in the New Jersey Register, See Third Quarter Report).

Abstract data come from seven sources: NJUP (New Jersey Hospital Utilization Program), PAS (Professional Activity Study of the Commission for Professional and Hospital Activities (CPHA), McAuto (McDonnell-Douglas) and from hospitals with independent abstracting systems. (See copies of the NJUP and PAS abstract forms which are used for the vast majority of acute care discharges in the state. (See Third Quarter Report).

Hospitals use either the International Classification of Diseases, adopted, Eighth Edition (ICDA-8) for diagnostic and procedural information or Hospital International Classification of Diseases, Adopted, Second Edition (HICDA-2).

Because of the varying formats used by the several abstract processors, it was necessary to develop a common format whereby the information of

interest could be taken from its original format and coding scheme and mapped to a common format and coding scheme. For example, "payment status" may be coded such that Blue Cross is '4' under PAS and '3' under NJUP, in which case both would be converted to a code of '2' under the common format. After the salient variables are merged to the common format a computer program, Grouper, collects the data items used to determine the DRG, identifies the configuration of codes, and assigns the appropriate DRG number according to the code configuration. The patients medical record number is retained with each DRG to allow re-entry by the hospital of major data items which fail certain edit screens. Patient billing identification numbers are used in merging the abstract with a patient's corresponding financial information. Length of stay is calculated for each patient and patients are assessed as to outlier status. Abstract data from independent sources (i.e., data from processors other than NJUP and PAS) are then subjected to a series of edit checks designed to assess accuracy and separate out inconsistent information.

The minimum data set items are listed below grouped by their current major purpose (DRG Formation, Cost Allocation, or Other).

DRG Formation

Hospital ID number	link patient and DRG to hospital
Admission Date	used for calculating length of stay
Dicharge Date	used for calculating length of stay and in merge process
Age of Patient	one of the independent variables used in DRG formation
Primary Diagnosis Secondary Diagnosis (first listed) Primary Surgical Procedure Secondary Surgical Procedure (first listed)	medical criteria used for classifying patients into DRG's

Discharge Status (alive or dead)	used to separate patients into specified DRG deaths
Medical Record Number	used for obtaining error corrections from hospital
Diagnosis/Procedure Coding Scheme	ICDA-8 or HICDA-2
Primary Clinic Service	used in DRG assignment of psychiatric patients

Cost Allocation

Payment Status	assigns patients by DRG to third party payors, pending claim verification by the payor
Primary special care unit days in unit	used in allocating housekeeping, laundry and linen, and nursing costs through development of Measures of Resource Use (See section III.A.2.b. of Manual)
Year/date/month of surgery	used indirectly in allocating patient care services to DRGs
Patient billing number	provides link to patient's bill

Other

sex	used in edit check process to assess consistency
race	not used at present
transfer destination	to be used to establish referral patterns among hospitals and to assess length of stay variation
clinical service	used in case-mix projections
hospital type	used to identify abstract processor
physical therapy respiratory therapy radiation therapy dialysis	not used at present

b. Measures of Resource Use

1. Overview

A Measure of Resource Use (MRU) is a statistic which indicates the relative amount of services a patient consumes from a given patient care allocation center. In order to properly allocate costs to patients or DRGs it is necessary (1) that a Measure of Resource Use be defined consistently across all inpatient accounts for all services rendered (and hence costs) through an allocation center, (2) that the MRU be sufficiently sensitive to reflect the differential diagnostic and therapeutic needs (demonstrated by different patients or patient types), with regard to a given center's services, (3) that the MRU be defined consistently across hospitals to allow for meaningful cost comparisons per DRG, and (4) that the MRU be readily obtainable from existing data sources.

Although MRUs are associated with each allocation center, rather than cost center (See Section III.A.1.d.), the discussion which follows is organized by cost center grouping (ancillary services, nursing services, and patient care general services) because of greater reader familiarity with the cost centers from which patient services originate and the general correspondence of cost centers with allocation centers.

2. Ancillary Service Charges

The DRG Cost Model's basic link between patient specific medical abstract information and aggregated hospital cost reports is provided by patient billing data. Borrowing from Medicare's basic cost finding methodology, a ratio of charges to charges applied to costs (RCCAC) is used to allocate the costs of each of fifteen uniformly defined ancillary services to the 383 DRGs (See Section III.A.3.c.).

Gross charges per patient may not be the optimal measure of Resource Use for ancillary service consumption. However, the general availability of per patient charges by cost (revenue) center, usually in a computer processable format (only three or four of New Jersey's 118 acute care hospitals remain on an all-inclusive rate, and 88 of the 118 maintained computer processing of bills as of December 1, 1977) has led to the use of gross charges in the DRG Cost Model rather than statistical data such as Relative Value Unit scales by cost center. (For a discussion of such alternative MRUs for ancillary services see Third Quarter Report.)

The primary precondition for a hospital's participation in the DRG Experiment NJII (the setting of DRG rates for 1978) was a hospital's submission of charge data in a uniform format for patient discharges in three of four quarters for 1978. It is important to note that it is not essential for a hospital which has reported close to 100% medical abstracts for a year's discharges to report 100% of its patient bills in order to derive a statistically significant pattern of ancillary service charges by patient case-mix. However, given the experimental nature of the DRG Cost Model in its first year, a full four quarters of charge data was requested and received from twenty of the twenty-two Participating Hospitals. (The remaining two hospitals had already purged the missing quarter's bills.)

The initial format for the submission of bills by uniform ancillary center (See Appendix B .) was somewhat lacking in detail as to the definition of reporting centers. It also contained a few reporting discrepancies when compared with the SHARE cost center definitions and, like SHARE,listed on Other Ancillary Services center. When hospital price list mappings to ancillary centers were compared, it became apparent that the desired degree of consistency of reporting across hospitals and within hospitals between costs and charges had not been achieved in several cases.

Eleven of the Participating Hospitals supplied detailed (itemized) charges per patient through their common billing processor, easing the process of sorting charges into consistent ancillary centers with the "catch-all" Other Ancillary Services center eliminated. Of the eleven remaining hospitals (four utilizing a second billing processor and seven with in-house capabilities),three showed no apparent reporting discrepancies, two reprocessed their bills into the refined common format, two hospitals with relatively minor reporting problems moved cost items to align with charge reporting, and four hospitals were unable to adjust their 1976 data reporting such that equitable rates could not be established.

In order to associate patient gross charge data with a patient's DRG, each bill must be merged with a medical abstract. Each medical abstract contains the patient's billing number as a required data element. Each of the two data sets are sorted by hospital by patient billing number and date of discharge. Considerable problems were encountered in aligning the two I.D. numbers from the two source documents. For some hospitals the number of digits for the billing number on the medical abstract was not

the same as for the patient bill. Furthermore, the alignment of digits was sometimes not synchronous for the two sources. Abstracts and/or bills with duplicate I.D. numbers had to be screened in order to eliminate the possibility of multiple abstracts or bills existing for a patient.

A significant number of abstracts and bills were found to have duplicate I.D.s. Discharge dates on abstracts and bills often disagreed, therefore the exact discharge date reported could not be relied upon to differentiate duplicate I.D.s. If the discharge dates differed by more than 30 days, the abstracts were considered non-duplicate and were included in the merge process. Non-mother or newborn abstracts having discharge dates within 30 days of each other were eliminated. Exact duplicate patient bills, except for newborn bills, were eliminated, as were non-newborn bills with discharge dates less than 30 days apart. This approach was a conservative one in which the elimination of potentially bad data was judged to be of more importance than the inclusion of potentially good data, thereby providing a very clean data base for DRG cost finding (See Section III.A.3).

As explained earlier, the merging of a patient's abstract with their bill is accomplished by matching an unique billing number which should have been reported on both the abstract and the bill. Unfortunately, not every hospital could provide a complete linkage between the patient abstract and all of the ancillary charges generated during a patient's stay in the hospital. Specifically, for several hospitals it was not possible through one linking number to separate all of the charges generated for mothers and their newborns and attach them to medical abstracts of each. The problem manifested itself in the following ways:

Case A: For 7 hospitals the charges accrued by a detained

newborn, prior to its' mother's discharge, could not be associated with the newborn's abstract. Only the charges accrued after the mother's discharge which were reported on a billing record written for this newborn could be tied to the abstract.

Case B: For 3 hospitals both the mother's and newborn's charges were submitted together on one bill and were not separately identified.

To deal with the above problems, all detained newborn charges accrued after the mother's discharge were aggregated. In Case A, this total was divided by the number of non-detained newborns and the resulting average amount added to the charges of each of the non-detained newborns.

In Case B, the aggregate detained charges were divided by the number of combined mother/newborn bills and the resulting average amount added to each combined mother/newborn bill.

In both cases these steps were taken in order to preserve the proper "Cost to Measure of Resource Use" ratio for all other patients and DRGs. They did not, however, provide a correct cost per DRG for mother and newborn DRGs for 10 of the Experiment II hospitals. Therefore, the merged mother and newborn abstracts and bills for these hospitals were eliminated from the number of merged cases used to develop the standard cost per case for DRGs 318 and 278-282 (i.e., all newborn and mother DRGs).

With the duplicate I.D. and mother/newborn problems resolved, the merging of abstracts and bills was completed with the resultant merged

records used to construct the "X" tape. (See Section III.A.3.a.) The relative success of the merge process by hospital is presented in Section III.A.3.b.

3. Nursing Relative Intensity Measures

In order to allocate nursing costs to DRGs, a Measure of Resource Use, termed a Relative Intensity Measure (RIM), was developed for nursing services with the tacit approval of the New Jersey State Nurses Association and the New Jersey Hospital Association. For 1978 rate-setting, RIMs were developed subjectively through nursing staff from the Participating Hospitals.

The construction of RIMs using nursing judgments was achieved by means of a modified "Q-sort" technique. (The Q-sort technique is a sorting procedure by which statements, adjectives, or objects are ordered by rank, on a prescribed scale.) Using certain medical and nursing criteria (listed below), nurses relied upon their clinical experience together with consideration of their hospital's nursing practice characteristics to rank the 383 DRGs relative to their intensity of nursing care needs. The essential rationale for this approach is based upon the assumption that (a) given DRGs whose descriptions provide an adequate profile of included patients and specify well-defined diagnoses and procedures, and (b) given commonalities in professional nursing, nursing judgments constitute an appropriate means for ranking DRG's.

Nurses were allowed two weeks to complete the DRG-sorting. The following criteria and rules were provided for performing the DRG-sorting.

(a) Each DRG was to be ranked according to the intensity of general nursing services that are required to meet the needs of the typical patient for a typical day of stay for the given DRG.

(b) Nursing services are highly variable within hospitals based upon a patient's diagnoses, age, severity of illness and unique needs for specialized nursing care. While these factors were considered in ranking any particular DRG, the final net assessment of intensity of general nursing services should reflect the amount of direct and indirect nursing resources required to treat the typical patient in a DRG.

(c) The DRG rankings should reflect the kind and intensity of nursing practice as it actually exists within the hospital participating in the Q-sort.

(d) The total operating environment for the delivery of nursing care prevailing within a participating hospital is a factor which may affect a nurse's assessments. Therefore, discussions of relative nursing intensity per patient type between hospitals when assigning ranks to the DRGs was not permitted in rendering judgments.

Accordingly, staff from each hospital independently sorted the DRGs into 20 categories (from low to high) (category 1 was low, category 20 was high) based on the nurses assessments of the intensity of nursing services required for a typical patient for a typical day of stay. This produced an ordinal scale of the DRGs. An ordinal scale is a ranking where one only knows that the points on the scale (in this case, category number) are in "order" such that point 1 is lower than point 2 which is lower than point 3 and so on. An example of an ordinal scale is a temperature measurement system of one, two, and three with "one" being cold, "two" being warm and"three" being hot.

Twenty DRGs uniformly distributed across the twenty categories and with highly stable rankings (i.e., the most consistent judgments) across hospitals, were chosen as anchor points to develop an interval scale. A common multiplier was calculated for the twenty ranks to place them on an interval scale and interval units for the remaining DRGs were interpolated mathematically using a linear technique. An interval scale is not only ordinal, but the differences between any two points is known to be a constant value. For example, a Fahrenheit temperature scale has values such that an "N" degree increase represents the identical increase in temperature anywhere along the scale - an increase of 2 degrees from 32 to 34 represents the same increase as an increase from 102 to 104 degrees.

Through the interval scale obtained from the nursing judgments, DRG 186 (gastric or peptic ulcer with a resection) may be determined to be 3 interval units per diem greater in intensity than DRG 183 (gastric or peptic ulcer without operation) and 6 interval units per diem more intensive than DRG 158 (hemorrhoids). However, without knowing either the per diem nursing costs of hemorrhoids or the value of an interval unit, one may not determine the relative costs of DRG 186 to DRG 158. The differences between DRG 158 and DRG 183 may be $10 or $50 with differences between DRG 158 and DRG 186 $20 or $100 respectively.

With only an interval scale, therefore, relative distances between DRGs would not allow a meaningful comparison of DRG nursing costs. Nursing intensity for hemorrhoids could be valued at 3, gastric or peptic ulcers at 6 and gastric or peptic ulcers with resection at 9. These three DRGs might be valued at 14:17:20:57:60:63, etc. While the

differences among the DRGs remain the same (0:3:6), the allocation of nursing costs would differ considerably. In order to obtain a benchmark for the interval units from an objective empirical source, 1976 actual SHARE nursing costs from the Participating Hospitals were used. The application of total costs and total interval units permitted the construction of a ratio scale. A ratio scale is ordinal and interval and any ratio, N, is constant anywhere along the scale - $50 is twice $25 and $10 is twice $5.

EXAMPLE: If all hospitals combined, treated only the three DRGs presented above for the following patient volumes incurring an aggregate nursing cost of $500,000, then RIMs could be calculated by the following steps:

DRG	PATIENTS	AVE LOS	PATIENT DAYS	PER DIEM INTERVAL SCALE A	POTENTIAL PER DIEM INTERVAL SCALE B	PER DIEM RATIO SCALE	RIMS
158	500	4	2000	3	14	x	2000x
183	1000	8	8000	6	17	x + 3	8000 (x + 3)
186	500	10	5000	9	20	x + 6	5000 (x + 6)

$500,000 = 2000 x 8000 (x + 3) + 5000 (x + 6)

$500,000 = 2000 x 8000 x + 24000 + 5000 x + 30000

$446,000 = 15000 x

$30 = x = Nursing cost per day of DRG 158

$33 = x = Nursing cost per day of DRG 183

$36 = x = Nursing cost per day of DRG 186

Although these RIMs are based on 1976 dollars, they are Relative Intensity Measures and should not be confused with dollars in the actual allocation of nursing costs to DRGs by hospital.

Total patient days for Acute Care Units, (includes Subacute) Intensive Care Units, and Newborn Nurseries were summed for the Participating Hospitals by DRG from the medical abstracts. These figures were normalized across the DRGs to account for missing abstract information to the SHARE reported numbers of patient days. (The ratio of ICU to ACU/SAC and NBN days across the Participating Hospitals was used to adjust the reported ratios from the medical abstracts in total, and hence by DRG. For a thorough discussion of such estimation procedures, See Section III-A.3.6, "Missing Data Estimation Procedures".) Total ACU, ICU, and NBN patient days were calculated for each DRG across the hospitals; the per diem interval units for each DRG were assigned to each of these days, and total interval units by type of patient day determined. Thus, total interval units for ICU were found for the Participating Hospitals, and using total ICU costs, RIMs per ICU day per DRG were solved algebraically. Equivalent procedures for ACU and NBN showed almost no difference in RIMs per patient day allowing NBN RIMs to be subsumed under ACU. RIMs per ACU day per DRG were determined by the same method as used for ICU. Each DRG, therefore, has both an ACU per diem RIM and an ICU per diem RIM, and each patient's allocation of nursing costs depends on their number of ACU days and ICU days and their DRG. Table VII (See pg. 122) presents these RIMs by DRG.

Because the judgmental ranks reflect total nursing resource consumption, each of the DRG Cost Model's nursing cost centers (Registered Nursing Services, Licensed Practical Nursing Services, Nursing Attendants, and Unit Clerical Services) were allocated by the same RIMs. Therefore, no attempt was made for 1978 rate-setting to distinguish differential consumption of nursing resources by skill level among DRGs.

TABLE VII

New Jersey Nursing Relative Intensity Measures (RIMs):
Acute Care Unit and Intensive Care Unit by
Diagnosis Related Group

DRG	ACU-NURSING RIMS	ICU-NURSING RIMS
1	27.40	80.05
2	22.40	75.05
3	24.90	77.55
4	25.50	78.15
5	28.60	81.25
6	30.10	82.75
7	27.20	79.85
8	27.20	79.85
9	25.00	77.65
10	24.80	77.45
11	27.80	80.45
12	28.00	80.65
13	28.50	81.15
14	26.40	79.05
15	24.60	77.25
16	30.50	83.15
17	21.10	73.75
18	22.60	75.25
19	27.40	80.05
20	28.80	81.45
21	25.50	78.15
22	24.80	77.45
23	26.70	79.35
24	28.00	80.65
25	26.00	78.65
26	26.50	79.15
27	25.80	78.45
28	26.40	79.05
29	29.50	82.15
30	29.00	81.65
31	24.50	77.15
32	26.60	79.25
33	27.20	79.85
34	28.40	81.05
35	26.50	79.15
36	24.50	77.15
37	26.60	79.25
38	30.90	83.55
39	31.20	83.85
40	33.30	85.95
41	33.60	86.25
42	26.90	79.55
43	28.80	81.45
44	27.90	80.55
45	30.60	83.25

DRG	ACU-NURSING RIMS	ICU-NURSING RIMS
46	32.00	84.65
47	31.70	84.35
48	29.90	82.55
49	29.80	82.45
50	29.20	81.85
51	27.50	80.15
52	28.80	81.45
53	22.40	75.05
54	23.10	75.75
55	19.70	72.35
56	25.80	78.45
57	27.20	79.85
58	27.10	79.75
59	27.00	79.65
60	22.50	75.15
61	27.90	80.55
62	27.40	80.05
63	28.10	80.75
64	29.00	81.65
65	28.30	80.95
66	27.40	80.05
67	27.80	80.45
68	31.30	83.95
69	21.50	74.15
70	28.30	80.95
71	29.40	82.05
72	31.40	84.05
73	27.10	79.75
74	25.20	77.85
75	29.20	81.85
76	26.00	78.65
77	25.80	78.45
78	22.80	75.45
79	22.20	24.85
80	30.60	83.25
81	25.90	78.55
82	31.50	84.15
83	29.30	81.95
84	24.70	77.35
85	30.50	84.15
86	29.60	82.25
87	31.40	84.05
88	27.60	80.25
89	29.50	82.15
90	27.90	80.55
91	27.30	79.95
92	26.00	78.65
93	23.20	75.85
94	32.50	85.15
95	25.20	77.85
96	25.10	77.75
97	26.40	79.05
98	26.50	79.15
99	30.80	83.45
100	26.60	79.25

DRG	ACU-NURSING RIMS	ICU-NURSING RIMS
101	25.50	78.15
102	19.90	72.55
103	21.50	74.15
104	25.90	78.55
105	25.70	78.35
106	25.70	78.35
107	19.80	72.45
108	22.40	75.05
109	22.40	75.05
110	23.50	78.15
111	36.00	70.85
112	22.70	75.35
113	23.90	76.55
114	22.80	75.45
115	24.20	78.85
116	29.10	81.75
117	23.40	76.05
118	27.10	79.75
119	30.50	83.15
120	28.80	81.35
121	30.10	82.75
122	27.30	79.95
123	26.80	79.45
124	29.70	82.35
125	29.20	81.85
126	27.80	80.45
127	30.80	83.45
128	30.30	82.95
129	31.20	83.85
130	31.50	84.15
131	28.70	81.35
132	29.60	82.25
133	30.70	83.35
134	29.90	82.55
135	32.00	84.65
136	33.40	86.05
137	84.10	86.75
138	30.60	83.25
139	25.80	78.45
140	28.90	81.55
141	30.20	82.85
142	31.90	84.55
143	31.70	84.35
144	32.00	84.65
145	28.50	81.15
146	23.70	76.35
147	28.60	81.25
148	28.90	81.55
149	23.80	76.45
150	24.30	76.95
151	27.50	80.15
152	26.30	78.95
153	27.80	80.45
154	21.40	81.35
155	31.10	83.75

DRG	ACU-NURSING RIMS	ICU-NURSING RIMS
156	25.80	78.45
157	26.30	78.95
158	20.00	72.65
159	21.50	74.15
160	26.20	78.85
161	26.40	79.05
162	22.50	75.15
163	24.30	76.95
164	24.00	76.65
165	25.90	78.55
166	24.80	77.45
167	26.70	79.35
168	26.80	79.45
169	24.70	77.35
170	23.60	76.25
171	27.90	80.55
172	30.50	83.15
173	27.20	79.85
174	29.40	82.05
175	29.90	82.55
176	30.10	82.75
177	32.30	84.95
178	31.60	84.25
179	30.70	83.35
180	31.10	83.75
181	19.40	72.05
182	22.50	75.15
183	22.30	74.95
184	24.60	77.25
185	23.00	75.65
186	29.10	81.75
187	28.90	81.55
188	20.90	73.55
189	24.00	76.65
190	22.40	75.05
191	25.80	78.45
192	28.90	81.55
193	23.50	76.15
194	24.90	77.55
195	29.50	82.15
196	29.00	81.65
197	22.40	75.05
198	21.30	73.95
199	23.50	76.15
200	19.90	72.55
201	21.80	74.45
202	24.90	77.55
203	20.70	73.35
204	23.50	76.15
205	25.80	78.35
206	22.00	74.65
207	27.90	80.55
208	24.00	76.65
209	26.30	78.95
210	27.40	80.05
211	20.50	73.15
212	23.20	74.85
213	23.70	76.35
214	22.80	75.45
215	25.50	78.15

DRG	ACU-NURSING RIMS	ICU-NURSING RIMS
216	27.10	79.75
217	23.90	76.55
218	25.40	78.05
219	28.40	81.05
220	29.30	81.95
221	28.60	81.25
222	28.40	81.05
223	25.40	78.05
224	27.80	80.45
225	24.70	77.35
226	24.30	76.95
227	26.60	79.25
228	27.60	80.25
229	27.40	80.05
230	26.80	79.45
231	28.10	80.75
232	23.30	75.95
233	26.60	79.25
234	31.70	84.35
235	32.20	84.85
236	25.50	78.15
237	26.10	78.75
238	32.60	85.25
239	23.10	75.75
240	24.70	77.35
241	25.40	78.05
242	28.10	80.75
243	21.50	74.15
244	23.10	75.75
245	25.50	78.15
246	23.90	76.55
247	23.50	78.15
248	24.40	77.05
249	23.50	76.15
250	29.50	82.15
251	21.20	73.85
252	24.30	76.95
253	25.40	78.05
254	25.60	78.25
255	26.60	79.25
256	27.40	80.05
257	21.30	73.95
258	21.10	73.75
259	23.90	76.55
260	25.20	77.85
261	19.00	71.65
262	21.60	74.25
263	23.30	75.95
264	24.50	77.15
265	24.30	76.95
266	27.90	80.55
267	20.10	72.75
268	22.10	74.75
269	25.40	78.05
270	24.50	77.15
271	22.00	74.65
272	24.30	76.95
273	20.60	73.25
274	32.00	84.65
275	33.80	86.35

DRG	ACU-NURSING RIMS	ICU-NURSING RIMS
276	26.80	79.45
277	28.70	81.35
278	23.90	76.55
279	25.90	28.55
280	27.20	79.85
281	30.00	82.65
282	32.80	85.45
283	19.20	71.85
284	20.40	73.05
285	25.20	77.85
286	24.10	76.75
287	26.40	79.05
288	24.80	77.45
289	20.10	72.75
290	23.50	76.15
291	24.30	76.95
292	29.20	81.85
293	29.90	82.55
294	28.40	81.05
295	23.40	76.05
296	28.20	80.85
297	21.70	74.35
298	27.80	80.45
299	27.30	79.95
300	28.00	80.65
301	29.70	82.35
302	19.00	71.65
303	23.60	76.25
304	23.50	76.15
305	25.10	77.75
306	28.40	81.05
307	27.70	80.35
308	31.60	84.25
309	28.00	80.65
310	30.60	83.25
311	28.40	81.05
312	31.50	84.15
313	32.20	84.85
314	33.60	86.25
315	34.50	87.15
316	34.10	86.75
317	32.90	85.55
318	22.60	75.25
319	23.20	75.85
320	34.70	87.35
321	34.40	87.05
322	25.10	77.75
323	31.00	83.65
324	29.70	82.35
325	26.20	78.85
326	30.00	82.65
327	21.90	74.55
328	24.10	76.75
329	22.90	75.55
330	28.80	81.45
331	18.80	71.45
332	27.80	80.45
333	25.60	78.35
334	23.10	75.75
335	29.10	81.75

DRG	ACU-NURSING RIMS	ICU-NURSING RIMS
336	28.00	80.65
337	28.00	80.65
338	29.80	82.45
339	29.20	81.85
340	28.00	80.65
341	25.50	28.15
342	26.20	78.85
343	27.80	80.45
344	27.80	80.45
345	29.00	81.65
346	29.10	81.75
347	27.40	80.05
348	29.60	82.25
349	21.50	74.15
350	21.70	74.35
351	26.00	78.65
352	26.70	79.35
353	26.90	79.55
354	34.80	87.45
355	35.60	88.25
356	34.00	86.65
357	27.30	79.95
358	33.50	86.15
359	31.40	84.05
360	21.00	73.65
361	27.70	80.35
362	27.70	80.35
363	23.20	75.85
364	28.60	81.25
365	30.80	83.45
366	31.00	83.65
367	27.00	79.65
368	33.70	86.35
369	28.20	80.85
370	29.70	82.35
371	29.60	82.25
372	34.40	87.05
373	33.10	85.75
374	31.90	84.55
375	32.00	84.65
376	31.60	84.25
377	32.60	85.25
378	29.00	81.65
379	25.70	78.35
380	27.30	79.95
381	22.40	75.05
382	23.00	75.65
383	30.40	83.05

4. Patient Care General Service Weights

General services, as classified by SHARE, are services provided by a hospital in addition to ancillary and nursing services (i.e., the residual of room and board costs after nursing costs are removed), including several cost centers which provide services directly to patients but which, like nursing, do not directly charge for their services. Four such services were identified for their involvement in patient care and sensitive to fluctuations in patient case-mix; hence, these services were included in the Case-Mix Model and appropriate Measures of Resource Use for them were developed.

a) Dietary Services

Preliminary studies have indicated that the cost of meals served in hospitals varies across diets and hence DRGs. For example, surgical patients typically do not receive meals the day of surgery, various illnesses require different diets which vary in raw food expense, certain conditions require supplemental tube feeding, and some illnesses require extensive teaching by professional dietitians.

The Project's current methodology for allocating dietary costs to DRGs is based on a dietary study conducted at Yale-New Haven Hospital in 1975-76 (See Dietary Diagnostic Costing Study II). The Yale-New Haven study developed an algorithm for distributing the costs of the dietary department among DRG's based upon the relative costs of raw food each group consumes:

annual cost of dietary service for DRG;	=	total annual cost of dietary services (direct & indirect)	X	ratio of weighted per diem average raw food costs for DRG; to total weighted per diem average raw food costs for all DRGs.

Thus, the proportion of total dietary department costs allocated to each DRG is simply the ratio of weighted patient day dietary costs summed across all DRGs.

The patient day dietary cost weights, established in the Yale-New Haven study, were derived from average raw food costs for the 83 Major Diagnostic Categories, and sampled during a period of one week with surgery-no surgery differentiated. Five cost intervals of 50¢, ranging from $1.00 to over $3.00, were used to assign the mean of the dietary raw food cost per patient day for each diagnostic group. The midpoint of each cost interval became the actual weight (because the average of all average raw food costs per diagnostic category falling into a given cost interval is likely, assuming statistical stability, to be at or near the value of the midpoint). Actual weights were coded 1, 2, 3, 4, and 5 to reflect their relative per diem value. Coded weights were then used in calculating the proportion of total costs to be assigned to the diagnostic category. Since diets were not costed out for each DRG, the weights assigned to the Major Diagnostic Categories were assigned to DRGs falling within that category subject to modification by professional dietitians and a physician using the coded weights as a benchmark.

Hypothetical Example

Suppose one wishes to allocate a portion of total dietary costs to DRG #8 using the algorithm outlined above.

Information required:

1. total annual cost of dietary services, direct and indirect = $150,000.
2. total annual number of patient days for DRG #8 = 500 days
3. average raw food cost weight per patient day assigned to DRG #8 (taken from Yale-New Haven study) = 6
4. average raw food cost weight assigned to each DRG multiplied by total annual number of patient days for that DRG summed across all DRGs = 59,000

(e.g., DRG #1 = (4 x 105)

+

DRG #2 = (5 x 200)

+

DRG #383 = (4 x 300)

Therefore,

Annual cost of dietary
service for DRG #8 = $150,000 (6 x 500) / 59,000)

= $150,000 x .0508

= $7,620.00

Table VIII presents the dietary weights by DRG currently used.

TABLE VIII

PER DIEM DIETARY WEIGHTS

DRG	WGHT	DRG	WGHT	DRG	WGHT	DRG	WGHT	DRG	WGHT	DRG	WGHT	DRG	WGHT	DRG	WGHT
1	4	2	5	3	5	4	5	5	5	6	4	7	6	8	6
9	5	10	4	11	4	12	6	13	5	14	5	15	4	16	4
17	6	18	5	19	5	20	5	20	5	21	5	22	5	23	4
25	5	26	5	27	4	28	3	29	4	30	4	31	5	32	5
33	4	34	4	35	5	36	5	37	4	38	4	39	4	40	4
41	5	42	4	43	4	44	3	45	5	46	4	47	6	48	6
49	6	50	5	51	4	52	4	53	5	54	5	55	5	56	5
57	4	58	4	59	4	60	5	61	5	62	5	63	5	64	5
65	5	66	4	67	3	68	3	69	5	70	5	71	5	72	4
73	5	74	5	75	5	76	5	77	4	78	5	79	5	80	5
81	5	82	5	83	5	84	5	85	5	86	5	87	5	88	5
89	5	90	5	91	5	92	5	93	5	94	5	95	5	96	5
97	5	98	5	99	4	100	5	101	4	102	5	103	5	104	5
105	5	106	4	107	5	108	5	109	5	110	4	111	4	112	5
113	5	114	4	115	4	116	4	117	5	118	5	119	5	120	4
121	5	122	5	123	5	124	6	125	5	126	3	127	3	128	5
129	5	130	5	131	3	132	5	133	3	134	5	135	5	136	5
137	4	138	3	139	6	140	6	141	7	142	7	143	7	144	7
145	4	146	5	147	5	148	5	149	5	150	5	151	4	152	4
153	3	154	5	155	5	156	5	157	5	158	4	159	3	160	5
161	5	162	5	163	4	164	3	165	5	166	5	167	5	168	4
169	5	170	5	171	5	172	5	173	5	174	5	175	5	176	5
177	4	178	5	179	4	180	3	181	4	182	3	183	5	184	5
185	5	186	3	187	3	188	5	189	5	190	4	191	4	192	3
193	3	194	3	195	3	196	2	197	4	198	4	199	4	200	5
201	4	202	3	203	5	204	4	205	3	206	5	207	5	208	4
209	4	210	3	211	4	212	4	213	5	214	5	215	5	216	5
217	4	218	4	219	3	220	3	221	4	222	4	223	3	224	3
225	5	226	5	227	4	228	4	229	4	230	5	231	3	232	5
233	5	234	5	235	5	236	4	237	4	238	3	239	5	240	5
241	4	242	3	243	5	244	5	245	5	246	5	247	5	248	4
249	4	250	3	251	5	252	5	253	5	254	4	255	4	256	3
257	5	258	5	259	4	260	4	261	5	262	5	263	5	264	4
265	4	266	3	267	5	268	5	269	4	270	4	271	5	272	4
273	5	274	5	275	5	276	5	277	4	278	5	279	3	280	3
281	5	282	3	283	5	284	5	285	5	286	5	287	4	288	4
289	5	290	5	291	5	292	5	293	4	294	4	295	5	296	4
297	5	298	5	299	5	300	4	301	4	302	5	303	5	304	5
305	5	306	5	307	4	308	4	309	4	310	4	311	3	312	3
313	3	314	3	315	4	316	3	317	3	318	4	319	3	320	3
321	3	322	5	323	5	324	5	325	5	326	3	327	5	328	5
329	4	330	3	331	5	332	5	333	5	334	4	335	3	336	5
337	5	338	5	339	5	340	5	341	5	342	5	343	4	344	4
345	4	346	4	347	4	348	3	349	5	350	5	351	5	352	5
353	4	354	4	355	4	356	4	357	4	358	4	359	3	360	5
361	5	362	5	363	4	364	4	365	4	366	4	367	4	368	4
369	5	370	5	371	5	372	4	373	4	374	5	375	5	376	5
377	5	378	5	379	5	380	5	381	4	382	4	383	4	384	4
385	4	386	4	387	4	388	4	389	4	390	4	391	4	392	4
393	4														

b) Housekeeping

The definition of the Housekeeping cost center provided by SHARE calls for the recasting of Housekeeping costs to Operating and Recovery, Delivery and Labor Rooms, and Newborn Nursery (not used as a nursing cost center by the Project). (See SHARE Manual, pp. B-62, C-12.) For future reporting, as well as for current reporting by the Participating Hospitals, these costs are functionally reported in Housekeeping. Utilizing Medicare allocation statistics, the costs of Housekeeping are allocated among the various hospital areas this department serves in order to associate the housekeeping cost center with Measures of Resource Use of the various allocation centers. Some Housekeeping is apportioned to Institutional Cost centers and evaluated as part of Institutional Costs. Where Housekeeping costs are apportioned to ancillary services or patient care general service cost centers, these services are allocated to DRGs by the Measure of Resource Use of the respective service.

Housekeeping apportioned to patient care units is summed in the Direct Housekeeping (DHK) allocation center and allocated to patients based on a formula (See Annual Report, Appendix II.A.) which takes into consideration (a) differences between patient room routine daily cleaning and the more time-consuming discharge or transfer cleaning (short-stay patients consume more housekeeping costs per diem than do long-stay patients), and (b) the greater housekeeping needs of isolation patients. These two factors (a, b) were derived from the results of a summary of the 21 Experiment II hospitals (See Figures 7 and 8 for a copy of this survey form and the survey's results.) The various components of Direct Housekeeping allocated by this formula are

FIGURE 7

Housekeeping Worksheet NJII Participating Hospitals

Hospital: _____

Please estimate the relative time required for each of the four activities listed below (absolute numbers need not be exact):

1. Routine daily housekeeping of a semi-private patient room, including a bath:

   _____ minutes

2. Discharge or post-transfer housekeeping of a semi-private patient room, including a bath:

   _____ minutes

3. Routine daily housekeeping of an isolation patient's room:

   _____ minutes

4. Discharge or post-transfer housekeeping of an isolation patient's room:

   _____ minutes

Please report the costs of housekeeping (not procedure set-up costs) reported in your 1976 SHARE actual cost reports in the following three cost centers:

	1,000s of $	
	Salaries	Supplies and Other
5. Operating and Recovery Room (ORR)		
6. Delivery and Labor Room (DEL)		
7. Newborn Nursery (NBN)		

PATIENT ROOM HOUSEKEEPING STUDY

Averages, Experiment II Hospitals

	Total time required for each room (in minutes)	Total time required per patient (Total time divided by number of patients in each room)
Average Routine daily housekeeping time required for a semi-private patient room including a bath.	27	13½
Average Routine housekeeping time required for a semi-private patient room following patient discharge or transfer.	40½	20¼
Average Routine daily housekeeping time required for an isolation patient's room.	34½	34½
Average Routine housekeeping time required for an isolation patient's room following patient discharge or transfer.	97½	97½

FIGURE 8

then re-collected for the patient service areas by patient, and hence DRG. In this manner, patient care Housekeeping can be evaluated by the needs of the patients it serves, rather than the square footage of the patient care service areas.

The formula outlined below is the Measure of Resource Use for Direct Housekeeping:

Direct Housekeeping Measure of Resource Use:

$$N W + N_2W_2 + N_3W_3 + (LOS_1) W_4 + (LOS_2) W_5$$

where

W_1 = weight for discharge or transfer from acute care unit

W_2 = weight for discharge or transfer from special care unit except isolation unit

W_3 = weight for discharge or transfer from isolation unit

W_4 = weight for LOS on acute care and intensive care units

W_5 = weight for LOS in isolation unit

N_1 = number of discharges or transfers from acute care units

N_2 = number of discharges or transfers from special care units except isolation unit

N_3 = number of discharges or transfers from isolation unit

LOS_1 = length of stay on acute care and special care units except isolation unit

LOS_2 = length of stay in isolation unit

c) Laundry and Linen

The association of Laundry and Linen costs with patient case-mix is similar to Housekeeping, although not as complex. As with Housekeeping, Laundry and Linen is spread to ancillary services and apportioned to patients based on their consumption of that service as determined by the ancillary allocation center's Measure of Resource Use.

Laundry and Linen allocated to patient floors is distributed to DRGs from three allocation centers; ACU, ICU and NBN using patient days within each of the three as their Measures of Resource Use.

d) Medical Records

It is quite likely that the amount of Medical Records time spent on a patient's record varies with case-mix. The amount of record-keeping and processing time spent on a terminal cancer patient's record should differ from that spent on an appendectomy patient's chart. While a large percent of this variance may be accounted for by length of stay, one might expect to find that fixed set-up times for each record are involved in addition to the variable time attributable to length of stay. For the DRG Cost Model, a factor of admission plus weeks of stay per patient (established judgementally by medical records personnel in the Yale-New Haven case-mix study) is used to control for this effect.

The Medical Records formula used to allocate total Medical Records cost to patients and subsequently DRGs is a weight of one (1) plus another (1) for each seven days of the patient's length of stay:

$$1 + \frac{\text{LOS for patient } j}{7}$$

These weights comprise the Measure of Resource Use for Medical Records.

3. Case-Mix Cost Finding

a. Creation of the "X" Tape

Once patient bills for the fifteen ancillary centers have been merged with their associated abstracts, the remaining Measures of Resource Use are calculated and added to each patient's merged record for the remaining ten allocation centers.

Identical nursing weights are calculated for the four nursing centers based on the patient's DRG assignment and ACU and ICU lengths of stay, which are obtained from the medical abstract. Medical Records weights are calculated from overall length of stay, dietary weights from length of stay and DRG assignment. Direct housekeeping weights are formulated for each patient based on the medical abstract's record of admission to one or more nursing units (ACU or NBN and ICU), isolation length of stay, and non-isolation length of stay. Finally, lengths of stay on Acute Care Units, Intensive Care Units, and Newborn Nursery are calculated for the allocation of floor stock, Medical-Surgical Supplies and Laundry and Linen.

The assignment of Measures of Resource Use for the twenty-five allocation centers takes place only for patients whose data was "clean" enough to assign the patient to a DRG, calculate length of stay, and merge valid billing information with the medical abstract via the patient linking number. These clean patient records are sorted by DRG and provide the data base from which rates are set. The 213,000 clean patient records for the 18 hospitals for 1976 which contain the twenty-five Measures of Resource Use and medical abstract information are stored on a magnetic tape (called the "X" tape) and are summarized for each hospital by DRG in Table 11 of the

Model Run "Measures of Resource Use of Allocations Center, by each DRG for Patients with Valid Merged Abstracts and Bills Only."

b. Missing Data Estimation Procedures

While 100% data reporting of bills and abstracts for any hospital is presently unachievable, (however some of the sample of hospitals had X tape records calculated for up to 98. % of their patient discharges. See Figure 9 .) all inpatient costs must be accounted for. Therefore, estimates are made for the DRG assignments and Measures of Resource Use for patients with missing data. The actual number of discharges including newborns was obtained from each hospital. Of this number of patients some subset was assigned to DRGs by receiving valid abstracts. Of the number of patient abstracts assigned to DRGs, some subset was merged with billing information and Measures of Resource Use assigned. (See Model Run Table 12.) In order to obtain the best estimate of the total Measures of Resource Use by DRG for patients with abstracts classified by DRG, the average value of each Measure of Resource Use for patients with valid merged abstracts and bills within a DRG is applied to any patient assigned to the DRG (valid abstract received) but for whom a bill could not be merged.

EXAMPLE A

DRG z

10 valid abstracts received
9 valid merged bills with abstracts
$810 total gross ORR charges, or $90 per patient
$900 estimated gross ORR charges for ten assigned patients

FIGURE 9

Merge Rates

	1	2	3
Atlantic City	.991	.551	.546
Cooper	.978	.631	.616
Dover	.999	.948	.948
Freehold	.804	.859	.691
Garden State	.987	.971	.959
Hamilton	.999	.991	.990
Hospital Center at Orange	.999	.977	.976
Hunterdon	.988	.929	.918
Millville	.999	.978	.978
Monmouth	.998	.953	.951
Morristown	.999	.976	.976
Overlook	.974	.868	.846
Passaic	.998	.602	.601
Perth Amboy	.993	.982	.976
Rancocas	.977	.966	.945
St. Michael's	.967	.962	.930
St. Elizabeth's	.919	.937	.861
West Jersey	.999	.972	.972

1 = % of valid abstracts to total estimated number of patients

2 = % of valid merged bills/abstracts to valid abstracts

3 = % of valid merged bills/abstracts to estimated number of patients

In order to account for patients without a valid abstract, a DRG assignment must be estimated based on the case-mix composition of patients with valid abstracts.

EXAMPLE B

Hospital A
1100 total discharges
1000 abstracts received falling into only 5 DRGs as follows:

DRG 1	400 or 40%
DRG 2	200 or 20%
DRG 3	200 or 20%
DRG 4	160 or 16%
DRG 5	40 or 4%

The one hundred patients with missing abstracts would be assigned as follows:

	100 Missing Abstracts	Estimated Total Patients
DRG 1	40	440
DRG 2	20	220
DRG 3	20	220
DRG 4	166	176
DRG 5	4	44

Measures of Resource Use are then estimated for patients with missing abstracts per example "A". Such patients estimates are always rounded to whole patients using a rounding algorithm by which the total number of actual discharges is always preserved. When abstracts are received for a DRG but no merge occurs, such abstracts are not used in the estimation procedures. This avoids the case where a DRG would be estimated to consume no Measures of Resource Use. In such instances these patients and DRGs are included in the rate determination process at the standard rate (See Section IV.D.1. below),

but are treated as missing abstracts for cost allocation purposes.

The estimated "Measures of Resource Use of Allocation Center by each DRG for Estimated Number of Patients" is included in Model Run Table 13. The proximity of the total estimated Measures of Resource Use for an ancillary center to a hospital's inpatient gross charges for the center provides a measure of accuracy of the estimation procedures in the DRG Cost Model.

c. DRG Costing

By dividing the total costs of each allocation center (bottom totals of Model Run Table 9) by the total estimated Measure of Resource Use for each allocation center of Table 13, Cost to Measure Ratios are derived. (Cost to charge ratios for ancillary centers.) By applying these ratios to the Measures of Resource Use for each DRG (Table 13 of the Model Run) costs per allocation center and in total are found.

Reversing the cost center apportionment process by applying the percent of cost of an allocation center originating in an initial cost center (Table 10) to the costs per DRG in an allocation center and summarizing these amounts for each cost center across the twenty-five allocation centers, costs per DRG by cost center are determined. (Model Run Table 15.) Dividing these costs by the estimated numer of patients in a DRG (Model Run Table 13) yields the "Average Cost per Case by Cost Center in each DRG," Model Run Table 16, also presented in percentages by cost center in Table 17.

Applying the Cost to Measure Ratios to the Measures of Resource Use of each patient record contained on the merged bill-abstract "X" tape and

reversing the allocation center to cost center apportionment process as above, costs per case by cost center for all clean patient records are found. This data set, used to formulate payment rates, is similarly stored on magnetic tape and termed the "Y" tape. From this data histograms are developed showing the relative dispersion of costs by DRG, by and across hospitals, allowing assessment of the basic premises of per DRG specific case reimbursement.

Each Participating Hospital is given a set of total cost histograms (refer to pp. 175,176, for examples) displaying the frequency distribution of costs by DRG. These enable the hospital to identify major trends or patterns of treatment within their institution by DRG. When total costs have a high standard deviation from the mean costs, this indicates that very different types of patients may have been classified into that DRG or at least that physician management may differ greatly for patients within the DRG.

B. INSTITUTIONAL COSTS

B. Institutional Costs

Institutional costs were differentiated from the "patient care related" DRG costs of the total hospital budget, and defined as the indirect costs of provision of patient care services. The appropriate cost analysis methodology had to be constructed in order to project a prospective budget for institutional services. While institutional costs may be fixed in the short term (e.g., on an annual basis) in relation to a hospital's patient case-mix and patient load, they may vary in the long term with the hospital's patient care services. The relationship is not a straightforward one.

Regression analysis was chosen as the appropriate means to examine the effect of many elements on the relative cost of managerial and related services required by any given hospital. Once the relative importance of these indicators was assessed, a hospital specific standard for institutional costs for each Participating Hospital was projected. Regression analysis is a refinement upon the concept of peer grouping. The experience of other studies[17] has shown that regression can be used to place hospitals along a continuum, thus producing a more sensitive description of cost variations than peer grouping, and providing a clearer rationale from which to base projections of hospital costs.

Those services specifically included in this analysis of institutional costs are the inpatient portions of the following SHARE centers:

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[17] See for example, (Judith R. Lave and Lester B. Lave), Health Services Research, "The Extent of Role Differentation among Hospitals" Spring 1971, pp. 15-38.

A & G:	Administration and General
EDR:	Education and Research
FIS:	Fiscal
HKP:	Non-patient care Housekeeping
INT:	Interest (working capital exclusive of Capital of Facilities Costs)
L&L:	Non-patient care Laundry and Linen
MAL:	Malpractice Insurance
OGS:	Other General Services
PCC:	Patient Care Coordination
PHY:	Physicians Coverage
PLT:	Plant (exclusive of Capital Facilities Costs)
RSD:	Residents

In order to arrive at an Institutional Cost payment for each of the Participating Hospitals, a total Institutional Cost budget was calculated for comparison with the standard. The successive steps for the computation of total Institutional Costs is detailed for each Participating Hospital in the Institutional Cost Run. Table 1, of the Institutional Cost Run, "Initial Costs by Element of Cost" displays each hospital's costs for the cost centers included in Institutional Costs, as reported on SHARE 1976 Actuals. The Housekeeping recast (See Section III.A.1.b.2) has been performed and the Dietary Adjustment has been added to "Other Expenses" (see Section III.A.1.b.2). Table 2 of the Institutional Cost Run, "Initial Costs adjusted for Fringe Benefits" presents these costs after the hospital specific fringe factor, shown at the bottom of Table 1 (see Section III.A.1.b.9), has been applied to employee and physician salaries. In Table 3, of the Institutional Cost Run, the expense recovery has been apportioned across

the elements of cost for each cost center (See above Section III.A.1). In Table 4, of the Institutional Cost Run, the Capital Facilities Costs (See Section III.C) are removed from the Plant and Interest cost centers. Working capital interest costs (SHARE element of cost "Other Expense") were separated from interest costs for construction mortgages and retained in the Institutional Cost budget. In the next step, Table 5, the covered inpatient portion for each cost center was determined based on the hospital's 1976 SHARE Actuals and applied to the costs in Table 4. The patient care portions of HKP and L&L cost centers are removed in Table 7 "Inpatient Institutional Costs with HKP and L&L Apportioned." The institutional cost portions of these centers are taken from the percent allocated to "COTH" on Model Run Table 9 (See Section III.A.d). At the completion of this step, each hospital's institutional costs have been determined.

In preparation for the development of the institutional cost standard, fifteen elements were identified as possible measures to approximate the variation in institutional costs among hospitals. The data were compiled for all acute care hospitals in New Jersey, using the most recent information available. The fifteen variables can be divided into four basic categories: general hospital characteristics, commitment to teaching, community demographics, and hospital geography (See Appendix C). Each variable was examined for its ability to predict 1976 total Insitutional Costs (total costs of the above mentioned cost centers for each hospital) to determine which variable, or group of variables accounted for the greatest amount of interhospital variation.

Some of the results of the regression analysis are presented in Table IX The correlations presented in Table IX describe the ability of each variable to predict the 1976 institutional costs fringed, in equalized dollars for 92

TABLE IX

Correlation with Total Institutional Costs

(N = 92 hospitals)

General Hospital Characteristics	
Hospital Plant Square Footage	0.79
Number of Licensed Beds	0.91
Total Acres of Hospital Property	0.01
Total Inpatients per Hospital for 1976	0.83
Total 1976 Patient Care Costs	0.93
Commitment to Teaching	
Number of Residents	0.84
Number of Approved Graduate Medical Programs	0.83
Other Students Hours	0.42
Community Demographics	
SMSA Population	- 0.02
County Population	0.29
Population Density per Municipality	0.22
Census Tract Income	- 0.19
Ratio of Medicaid Admissions	0.26
Hospital Geography	
Distance from Times Square, N.Y.C.	- 0.22
Distance from City Hall, Philadelphia	0.02

hospitals with complete data. The closer the correlation is to 1.0, the better the predictive ability. Institutional Costs correlated highly with two categories of independent variables, measures of general size of the hospital and commitment to teaching. Total Patient Care Cost was chosen over other measures of "size" because it measures actual service volumes for the types of patients treated, while bed count only indicates potential patient volume regardless of actual utilization levels, and admissions do not account for the complexity of the services delivered to these patients. The number of residency positions offered was chosen over the number of programs as the more sensitive measure of teaching, (i.e., a single teaching program could contain two (2) or twenty (20) residents). It should be noted that the number of residency positions which have been accredited by the Liaison Committee on Graduate Medical Education is not intended to be a body count for residents, but rather is used as a measure of the hospital's commitment to graduate medical education. Accreditation indicates the approximate number of residents that the institution is equipped to train. In an attempt to isolate resident time spent on inpatient care from time spent in clinics or the emergency room, the inpatient (CIP) ratio for the residents cost center was applied to the total number of residents per hospital.

The regression equation resulting from the analysis and used as the standard for reimbursing institutional costs is:

Total Institutional Costs Standard = $177,727 + .273 (Total Patient Care Costs) + $19,111 (CIP LCGME Approved Residency Positions)

R^2 = .94 where R^2 x 100 is the percent of interhospital variance explained by the equation. The equation accounts for most of the sources of variance among hospitals in their institutional costs, identifies the major relationships between the hospital's environment and costs, and provides a reasonably sound standard for institutional costs by level of service.

C. CAPITAL FACILITIES COSTS

C. Capital Facilities Costs

Depreciation, interest, and lease costs, originally reported in the SHARE cost center Plant (PLT), are not included in Patient Care Costs. Rather, they have been included in cost category termed "Capital Facilities Costs." Also included in this category are depreciation and interest costs reported in the SHARE cost center Interest (INT), and utility costs reported in the SHARE cost center Utilities (UTC). It is important to note that depreciation and interest reported in the SHARE cost centers LAB, BBK, RAD, DIA, and EDG, are included in the "DRG Cost Model," rather than in "Capital Facilities Costs," because these typically are significant capital/labor trade-offs in these areas, (e.g., substitutability of automated laboratory equipment for additional technicians).

D. PAYOR AND HOSPITAL COST ADJUSTMENTS

D. Payor and Hospital Cost Adjustments

Hospital Costs discussed in the three previous sections include only the direct components of the provision of care to inpatients. In order to arrive at a DRG reimbursement rate comparable with the present Blue Cross oriented SHARE rate-setting system, certain adjustments reflecting reporting and payment practices which differ as to inclusion or exclusion in an individual hospital's budget of third party payor's rate. For the 1978 simulation no tests of reasonableness are administered with regard to:

- Ancillary Physicians and Anesthesiology
- Radiology Fee-for-Service
- Emergency Services Covered Inpatient
- Emergency Room Deficit
- Rider J
- Pacemaker, Nuclear Medicine, and Therapeutic Radiology Exclusions
- Outside Collection Costs
- Costing Differentials
- Medicare Carve-Out

1. Ancillary Physicians and Anesthesiology

Chapter 136 before its S.446 amendments defined a "health care facility" to include physician services (where the physician's compensation is derived through the health care facility). While this definition may have been intended to separate the attending physician's private practice from the operations of a hospital, in practice it has led to

considerable interhospital differences in the reporting of hospital based physician costs.

In order to arrive at an acceptable level of fairness in comparing one hospital's costs with another, the DRG Cost Model includes physician salaries or fees only where all hospitals provide full reporting of such compensation as part of the hospital's operations. Such commonality of reporting exists for physician compensation where the physician provides services in an educational or administrative capacity (the PHY, RSD, PCC, and EDR cost centers) and in the specialty of pathology (the LAB and BBK cost centers).

In other cost centers comparability of reporting of physician costs does not exist since hospital based specialities such as radiologists, cardiologists, and physiatrists may practice under a variety of compensatory arrangements. If the physician is salaried, receives a percentage of the net or gross revenues of a hospital's service, or charges through the hospital's billing system, such compensation is reported as part of the hospital's budget. If the physician bills the patient without using the hospital's charge system, his compensation is neither defined nor reported as part of the hospital budget, regardless of distinctions between Blue Cross and Blue Shield or Medicare/Medicaid Part A and Part B. Therefore, in order to preserve comparability of costs, ancillary physician salaries and fees are not included as part of DRG costs (See Section III A.1.). Instead they are included in a hospital's rate at their 1977 SHARE actual amount, increased by appropriate economic factors. (See Section IV.B) The entire Anesthesiology (ANS) cost center except supplies is similarly included in the rate at 1977 actual cost, increase

by appropriate economic factors.

2. Radiology Fee for Service

If a hospital's radiologist(s) directly bill(s) all patients on a fee-for-service basis and if the hospital has agreed to pay such bills for professional services rendered Blue Cross patients, the present New Jersey Blue Cross Plan reimburses the hospital for such payments at a predetermined rate agreed upon by the hospital and Blue Cross.

For the 1978 simulation these costs are reimbursed at the 1978 SHARE APR rate. This amount is subject to revision after completion of the Blue Cross field audit.

3. Emergency Services Covered Inpatient Costs

While New Jersey Blue Cross currently does not reimburse hospitals for most outpatient services under its basic contract with New Jersey hospitals, it does reimburse the emergency room costs associated with the admission of Blue Cross patients through the emergency room. Ancillary service costs, associated with emergency room visits which result in an admission, are included in DRG costs.

Total Emergency Room costs increased or decreased in no consistent pattern between 1976 actuals, 1977 projected, and 1978 budgets by hospital or across the 18 hospitals. Therefore, for the simulated rate, Emergency Room costs are reimbursed in an amount equal to the hospital's 1977 actual costs as reported under SHARE and increased to 1978 dollars by the application of separate economic factors for the different elements of Emergency Room costs (See Section IV.B.). An estimate of 1977 Emergency Room supply costs was used for those hospitals which had reported supplies in both CSS and EMR. This estimate was arrived at by dividing the hospital's CSS costs, found in Model Run Table 9 under OTH,

by the hospitals 1976 CIP SHARE EMR supply costs. The resulting percentage is then applied to 1977 actual supply costs reported under SHARE. Costs related to volume changes were accounted for by dividing 1978 budgeted Emergency Room admissions by 1977 actual Emergency Room admissions and applying the resulting factor to 1977 actual EMR CIP dollars.

4. Emergency Room Deficit

For the 1978 simulation, a hospital's Emergency Room Deficit is reimbursed at the amount calculated under the SHARE system. That is, if a hospital's calculated reasonable deficit is less than its budgeted deficit, only the calculated reasonable amount is included in the rate. If it is more than the budgeted, the hospital receives its budgeted amount. For details, refer to SHARE 1978 Budget form F and schedules A and F.

5. Rider J

At the present time the Hospital Service Plan of New Jersey (NJ Blue Cross Plan) offers an Extended Out-Patient Benefit Rider (J). Covered benefits vary but generally include such things as outpatient lab tests, radiology exams, and physical therapy, provided these are ordered by a physician, performed by a hospital employee, and necessary for the diagnosis and/or treatment of a sickness or injury.

For rendering these services the hospital collects fees from the Plan. Should the fees collected be less than: (1) the variable Sliding Scale cost per visit as shown in item K (a) of Blue Cross Schedule "1" (See Table X) or; (2) the average cost of all outpatient visits as determined by an approved outpatient cost study, the hospital receives an adjustment in the amount of the difference between the two. If a hospital uses the Out-Patient Cost Study to

determine the adjustment amount it is due, the adjustment it receives is subject to possible revision after completion of the yearly Blue Cross field audit.

6. Pacemaker, Nuclear Medicine, and Therapeutic Radiology Costs

Because pacemakers, nuclear medicine, and therapeutic radiology are intergal parts of the patterns of care used in treating many of the DRGs, but are not reimbursable under the present Blue Cross contract, their related costs are, at first, included in the DRG Cost Model in order to arrive at a comparison of treatment patterns across hospitals, upon which the DRG reimbursement system is based. For a specific description of how these costs are initially included in the model, see Section III.A.1.c.

After costs and rates have been determined,these costs are deducted from a hospital's final reimbursement. This is determined by calculating the percentage of total inpatient costs,these costs represent and applying this percentage to the DRG rate budget. (See Section V.D.1.)

7. Outside Collection Costs

The Blue Cross Plan presently reimburses certain outside collections and bad debts associated with New Jersey Blue Cross Patients. (For details see the Blue Cross Contract.) For the simulation, these costs are included in the rate in an amount equal to the per diem Outside Collection Costs recorded on the 1978 SHARE APR, Schedule A.1. As with the other add-on adjustments, these costs are subject to revision after completion of the Blue Cross field audit.

8. Costing Differentials

Costing Differentials consist of those costs which a hospital can document as having been classified differently by SHARE methodology, than Blue Cross cost finding methodology and thus excluded from the SHARE per diem rate.

These costs are evaluated via the methodology outlined in the SHARE Manual, pp. C-6 and E-27 and a letter from Share's Rate-Setting Coordinator (See Appendix D). Basically, the procedure involves comparing covered inpatient costs as calculated via SHARE's methodology, with the results of an alternative cost allocation methodology selected by the hospital such as the Medicare "Stepdown" or some other method approved by New Jersey Blue Cross. Any difference, whether it is positive or negative becomes a payor cost adjustment, provided it has been deemed correctly calculated by SHARE analysts and does not exceed the hospital's budgeted amount.

9. Medicare Carve-Out

In order to approximate those costs attributable to Blue Cross patients, an adjustment is performed to eliminate case-mix biases in a hospital's overall per diem costs applicable to the differential resource consumption of Medicare patients and to account for reimbursement differences between Title XVIII principles and Blue Cross/SHARE per diem rate determination.

This is done by taking the difference between the Average Cost per patient day as reported on the Hospital Service Plan of New Jersey Schedule "1" (line J) and the Reimbursable Cost per patient day (line H) and adding the difference to the SHARE CIP per diem. For example, as shown on Table X , hospital's Total Expenses (line H) are $77,090, and Total In-Patient

HOSPITAL SERVICE PLAN OF NEW JERSEY
SCHEDULE "I"
(FORMULA FOR CALCULATING AVERAGE COST PER IN-PATIENT DAY)

Name and Address of Hospital: _____

Fiscal Year Ending _____ Hospital Plan Code Number [ ]

BE SURE TO READ GENERAL AND SPECIFIC INSTRUCTIONS FOR COMPLETING SCHEDULE "I" BEFORE PROCEEDING — FOR PLAN USE ONLY

A	Total direct operating expenses as per Schedule II	$	$
A-1.	Additional amount for deferred portion of prior years' expenses applicable to this year as per Schedule III.		
B.	Total allowable expenses (sum of A and A-1)	$	$
C.	Less		
	(a) Items of income which are actually recovery of expense as per Schedule II-A	$	$
	(b) Non-eligible services, as per Schedule IV		
	(c) Deduction for emergency care as per Schedule V-B		
	(d) Preliminary computation figure for classification purposes for clinic and private ambulatory out-patient expenses (see specific instructions):		
	_____ Visits X $3.50 as per Schedule V-A		
	Out-Patient expense per cost study		
D.	Total of amounts shown in Item C	$	$
E.	Item B less Item D		
F	Actual Depreciation or 3% of Item E, Schedule I, 1963 Reimbursable Cost Manual		
	This line is to be used only if the Hospital uses Out-Patient Expense Per Cost Study See instructions for completing Schedule "I-B".		
G.	Interest on capital debt		
H.	TOTAL EXPENSES FOR PRELIMINARY COMPUTATION (Total of Items E, F, and G)	$ 77,090.00	$
I.	TOTAL IN-PATIENT DAYS (EXCLUSIVE OF NEWBORN DAYS)	42,643.00	
J.	PRELIMINARY AVERAGE COST PER IN-PATIENT DAY (Item H ÷ Item I)	$ 180.78	$
K.	ADJUSTMENT FOR CLINIC AND PRIVATE AMBULATORY OUT-PATIENT EXPENSE		
	(a) Number of visits _____ x $_____ (Variable cost—See Schedule I-A) =	$	$
	(b) Number of visits x $3.50 [Same as Item C(d)]		
	(c) Excess of (b) over (a) (if any) (+)		
	(d) Excess of (a) over (b) (if any) (−)		
L.	Enter same amount as Item E		
M.	Item L plus Item K(c) or Item L less Item K(d) (whichever applicable)	$	$
N.	Actual Depreciation or 3% of Item M, Schedule I, 1963 Reimbursable Cost Manual		
O.	Adjustment for services rendered under Extended Out-Patient Hospital Benefits Rider as per Schedule "I-B"		
P.	Interest on capital debt		
Q.	TOTAL EXPENSES (Total of Items M, N, O, P)	$	$
R	Total expenses applicable to Medicare in-patients as per Schedule "I-C".		
S	TOTAL EXPENSES FOR REIMBURSEMENT COMPUTATION (Item Q less Item R)	$ 45,480.00	$
T.	Total in-patient days (Same as Item I)	42,643.00	
U	Total Medicare in-patient days	18,765.00	
V	IN-PATIENT DAYS FOR REIMBURSEMENT COMPUTATION (Item T less Item U)	23,878.00	
W	REIMBURSABLE COST PER IN-PATIENT DAY (Item S ÷ Item V)	$ 190.46	$
	Cost per out-patient day of outside collection expense and bad debts for New Jersey Blue Cross patients as per Schedule I-C.		
X.	TOTAL REIMBURSABLE COST PER IN-PATIENT DAY (Total of Items W and X)	$	$

Days (excluding newborns) (line I) are 42,643, then the Average Cost per Patient Day (line J) is $180.78. Further, it is necessary to determine the costs associated with a Medicare Patient in relation to all other patients. For example, if Total Expenses for Reimbursement Computation (line S) are 4,548,000, Total In-Patient Days are 42,643 (line T), Total Medicare inpatient days are 18,765 (line U), then the Inpatient Days for Reimbursement Computation (line V) are 23,878 resulting in a Reimburseable Cost per inpatient day (line W) of $190.46. Hence, the difference between $180.78 (line J) and $190.46 (line W) or $9.68 is the Medicare Carve-Out. For this 1978 simulation rate the Medicare Carve-Out listed on form A of the 1978 SHARE budget is included as a "Payor Adjustment."

IV. Projection of Budget

A. Equalization

In order to compare costs of hospitals located in different regions of the state, it is necessary to control for geographic wage differentials which may exist throughout New Jersey. Hospital supply prices are assumed to be stable from area to area within New Jersey, given state-wide or national vendors and shared purchasing services such as those sponsored by the New Jersey Hospital Association. For the calculation of 1978 case-mix payment rates the SHARE equalization process (Refer to SHARE Manual, p. F-78.) was used.[18] Each hospital is classified by the SHARE system into one of three salary regions - North, Metropolitan, and Rural. (Refer to SHARE Manual, p. G-18.) Indices are developed which take the 1976 Actual median compensation rate value for the following typologies of cost centers:

(a) administrative and clerical

(b) general services

(c) nursing and ancillary services

on both a statewide basis as well as for each of the three salary regions. (See Figure 10 for these factors by region for 1976 actual costs.) The appropriate ratios are then computed (as shown for each hospital's salary region on Table 18 of the Model Run, "Labor Equalization on Factors for non-physicians Element of Cost" for each Cost center) and applied to the actual labor costs for each of the above functional types of labor. (See Table 19 of the Model Run.) Because of the lack of consistency observed among the three salary regions with regard to physician salaries in the Institutional Cost centers of Physicians Coverage, Residents, and Education and Research physician, salaries are not equalized (unlike the SHARE system) when these costs are entered into the Institutional Cost Method-

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18 Refer to Section VI which discusses alternative methodologies to be explored.

ology.

Table 20 of the Model Run, "Equalization Factors by Cost Center", shows the equalization factors for each cost center for each hospital (the percent of a cost center's costs which are labor times the equalization factor plus the percent which is non-labor times one) and Model Run Table 23 shows un-equalization factors by cost center (the reciprocal of a cost center's equal-ization factor). Finally the DRG rate setting process (See Section IV.D.1) requires the computation of an unequalization factor by DRG for each hospital as shown in Model Run Table 22 (the percent of a hospital's costs for a DRG coming from a cost center times the cost center's unequalization factor, summed across all cost centers utilized by the DRG).

Similarly, Institutional Cost Table 8 shows "Labor Equalization Factors for Employee Salaries for each Cost Center" which applies to Institutional Costs in Table 9. An unequalization factor for Institutional Costs was computed for each hospital by dividing 1976 Institutional Costs by 1976 equalized In-stitutional Costs, shown at the bottom of Institutional Cost Table 9. (This procedure is equivalent to multiplying the percent of non-physician labor in each Institutional Cost center divided by the center's appropriate equalization factor times the percent of a hospital's Institutional Costs in the cost center, summed over all Institutional Cost centers.)

Figure 10

1976 Actual Equalization Factors

	Administration[1]	Patient[2]	Service[3]
Metro	1.0307	1.0276	1.0248
North	.9572	.9574	.9385
Rural	1.1527	1.0606	1.1428

1. Applied to the A&G, EDR, FIS, MRD, PHY, PCC, and RSD cost centers.

2. Applied to the Ancillary and Nursing cost centers.

3. Applied to the DTY, HKP, L&L, OGS and PLT cost centers.

B. Economic Factor

In 1976, the goal of the Commissioners of Health and Insurance as described in the SHARE Guidelines (G-10) was "to develop and promulgate an industry wide economic factor to account for presumptively reasonable increases in expenses due to inflation, compensation increases, and other cost factors." At this time the factor in question was "the weighted average of the latest reported twelve-month percentage changes in both the National Consumer Prince Index (CPI) and the Average Hourly Earnings of Manufacturing Employees in New Jersey published by the Bureau of Labor Statistics. The weights to be applied are 2/3 to average hourly earnings and 1/3 to the CPI."

Following a hearing on October 8, 1976, the Honorable Sidney Goldmann concluded that the Economic Factor was "lacking in refinement and fairness." The CPI and the Average Hourly Earnings of Manufacturing Employees in New Jersey did not accurately reflect the purchasing patterns nor the labor mix in the hospital industry.

As a result of Judge Goldmann's decision, the Department of Health pursued the development of a new Economic Factor which relates the rate of inflation in the general economy for the same or similar types of inputs which hospitals consume (i.e., the use of "proxies"), weighted to reflect each cost category's percentage of a hospital's budget. The Economic Factor relies primarily upon proxies from three sources of the federal government's Bureau of Labor Statistics: the Consumer Price Index (CPI), the Wholesale Price Index (WPI), and the Employment Cost Index (ECI). The Economic Factor categorizes costs reported to SHARE into relevant cost components in order

to weight the indices of the proxies chosen to monitor inflation across the cost components. This Economic Factor is applied to the expenditure pattern of each hospital in the DRG and Institutional Cost Models, unlike the present SHARE methodology.

The categorizations and choice of proxies used in the current DRG and Institutional Cost Models are shown on the following pages. The indices input are 1976 year end data, compounded in order to account for two years of inflation between 1976 and 1978. (Unlike the proposed NJHA Factor, the Department's Factor currently lacks a projection methodology, and hence 1977's inflation was used as a "best guess" for the indices for 1978.) Table 24 of the Model Run and Table 10 of Institutional Cost Run presents these compounded Factors for each cost center and element of cost. Table 25 of the Model Run and Table 11 of the Institutional Cost Run show the results of applying the Economic Factor to 1976 costs. Where depreciation and interest are included within the costs of a cost center, a "Factor" was calculated for these expenses for each hospital by dividing 1978 Budgeted costs by 1976 Actual costs. The Economic Factor for Malpractice insurance, a pass-through for 1977 rates, was computed by dividing each hospital's 1977 Projected Malpractice cost by its 1976 Actual MAL cost times the Economic Factor estimate for 1978 (when it is not treated as a pass-through in the DRG Payment System) for other services. Dividing 1978 inflated Institutional Costs by 1976 Actual Institutional Costs derives an overall Institutional Cost Economic Factor, shown at the bottom of Table 11 of the Institutional Cost Run.

LABOR 1.

COST COMPONENT: Non Physician-Salaries, Physician's Salaries and Fees

PROXIES: Employment Cost Index (ECI) Northeast

While the cost component represents a full aggregation of hospital labor and hence does notfully reflect the mix of labor in hospitals, the ECI similarily aggregates professional, technical, clerical and services workers for a particular region. Please note the NJHA proposed factor applies the same proxy to most hospital labor.

LABOR 2.

COST COMPONENT: Fringe Benefits

PROXIES: Supplements to Income, Survey of Current Business, United States Department of Commerce.

This proxy aggregates the second component of labor and ties hospital fringes to increases in fringes of all workers in the economy.

SUPPLIES 1.

COST COMPONENT: Office Supplies

PROXIES: WPI 0915-06 Office Supplies and Accessories (20%)

WPI 0913-0131.09 Paper Bond No. 4 (40%)

WPI 0913-0133.01 Paper, Form Bond 12 lb. (25%)

SUPPLIES 2.

COST COMPONENT: Medical Records Supplies

PROXIES: WPI 0916-06 Office Supplies and Accessories (50%)

WPI 0913-0131.09 Paper Bond No. 4 (25%)

WPI 0913-0133.01 Paper, Form Bond 12 lb. (25%)

Hospitals' mix of paper typically used in office supplies are reflected in the proxies for these cost components.

SUPPLIES 3.

COST COMPONENT: Raw Food

PROXIES: WPI 02 less 029 Processed Foods and Feeds Less Animal Feeds

Cost increases for hospital food are tied to wholesale price increases for foods in the general economy.

SUPPLIES 4.

COST COMPONENT: Other Dietary Supplies

PROXIES: WPI 0915-0109.05 Paper Goods, Household Napkins (10%)

WPI 0915-0335.02 Paper Goods, Paper Plates (10%)

WPI 0915-0333.03 Paper Goods, Hot Cups (10%)

WPI 0722-0204.05 Plastic Goods, Polyethylene Liner (7.5%)

WPI 1261 Dinnerware (22.5%)

WPI 1264-0113.02 Household Flat Ware, Stainless Steel (22.5%)

WPI 0671 Soap and Synthetic Detergent (17.5%)

These proxies represent hospitals' approximate expenditure patterns in this area, as obtained from a phone survey of Patient Diet Mix Study Hospitals.

SUPPLIES 5.

COST COMPONENT: Housekeeping Supplies

PROXIES: WPI 0915-01 Sanitary Paper and Health Products (30%)

WPI 0722.02 Polyethylene (20%)

WPI 0361 Textile House Furnishings, Cotton (10%)

WPI 0671 Soap and Synthetic Detergents (40%)

These proxies represent specific items and components related to the non-salary portion of housekeeping.

SUPPLIES 6.

COST COMPONENT: Laundry and Linen Supplies

PROXIES: WPI 0671 Soap and Synthetic Detergents (60%)

CPI Linen (40%)

These proxies represent the components relating to a hospital that processes their own laundry.

SUPPLIES 7.

COST COMPONENT: Repairs and Maintenance Supplies

PROXIES: CPI Maintenance and Repairs Commodities (50%)

WPI 1081 Bolts, Nuts, Screws, and Rivets (25%)

WPI 1083 Lighting Fixtures (25%)

These proxies measure price trends for maintenance and repair commodities for hospital maintenance departments.

SUPPLIES 8.

COST COMPONENT: Drugs

PROXIES: WPI 063 less 0636 Drugs and Pharmaceuticals

This proxy provides an index of prices of drugs consumed in the general economy.

SUPPLIES 9.

COST COMPONENT: Laboratory Supplies

PROXIES: WPI 138 Glassware (18%)

WPI 061 Reagents Industrial Chemicals (82%)

This proxy represents the major components of cost for this area, with reagents' prices tied to the prices of their imput chemicals.

SUPPLIES 10.

COST COMPONENT: Diagnostic Radiology Supplies

PROXIES: WPI 1542 Photographic Supplies

This proxy provides an index for film and related supplies.

SUPPLIES 11.

COST COMPONENT: Medical/Surgical Supplies

PROXIES: CPI Adhesive Bandages, Package (9.7%)

WPI 07 Rubber and Plastic Products (30.9%)

WPI 067 less 067.9 Other Chemicals and Allied Products (3.3%)

WPI 1135.02 Precision Measuring Tools (1.6%)

WPI 061 Industrial Chemicals (3.7%)

WPI 063 less 063.6 Chemicals, Drugs and Pharmaceuticals (18.8%)

WPI 0915.01 Sanitary Papers and Health Products (5%)

WPI 0361 Cotton (10.4%)

WPI 0327.03 Synthetic Threads (76.%)

WPI 1132 Power Driven Hand Tools (0.7%)

WPI 1135.01 Small Cutting Tools (8.3%)

The identification of each component of cost in this areas was done by a study by McGraw Hill, Modern Health Care. Published proxies were then identified for each category.

SUPPLIES 12.

COST COMPONENT: Electrodiagnosis Supplies

PROXIES: WPI Table 13, 36241 Electrodes (63%)

WPI 0913.01 Paper except Newsprint (37%)

These proxies represent hospitals expenditures in this area.

OTHER 1.

COST COMPONENT: Contracted Laundry and Linen

PROXIES: CPI Housekeeping Services, Laundry, Flatwork, Finished Service (80%)

CPI Household Furnishings and Operation Textiles, Sheets, Full, Flat (20%)

The proxies selected measure the price trends for finished laundry and linen for hospitals that do not process their own laundry.

OTHER 2.

COST COMPONENT: Other Expenses

PROXIES: CPI Services, Services less rent except Medical Care Services

This proxy was chosen to provide a "catch-all" for those costs not related to a specific proxy.

OTHER 3.

COST COMPONENT: Working Capital Interest

PROXY: Prime Interest Rate

The short term interest rates paid by hospitals follow the prime interest rate, hence the selection of this proxy.

SHARE - 1976 ACTUAL
COST CENTER DATA

FIGURE 11

C Page 1 of 2.

Hospital Number [| | | |]

ECONOMIC FACTOR BY COST CENTER BY ELEMENT OF COST Hospital:

COST CENTER		Hours: Employees	Hours: Physicians Salaries	Hours: Physicians Fees	Costs (000): Salaries Empl.	Salaries Phys.	Phys. Fees	Supp.	Cont. Serv.	Oth. Exp.	Dep.& Fac. Int	Lease Cost	Exp. Rec.	Total Cost	Costs 1976 Projected
ACU	Acute Care Units		//////	///////	LABOR	//////	//////	Supp11	LABOR	Oth 2	////	////	APPORTIONED		
ICU	Intensive Care Units		//////	///////		//////	//////	Supp11			////	////			
NBN	Newborn Nursery		///////	///////		//////	//////	Supp11			////	////			
SAC	Sub-Acute Care Units		///////	///////		//////	//////	Supp11			////	////			
SNF	Skilled Nursing Facility		//////	///////		//////	//////	Supp11			////	////			
EMR	Emergency Room					LABOR	LABOR	Supp11			////	////			
CLN	Clinics							Supp11			////	////			
OHS	OFF-SITE HEALTH SERVICES							Supp11			////	////			
ANS	Anesthesiology							Supp11	Oth 2		////	////			
BBK	Blood Bank							Supp 9			BUDGET				
CSS	Central & Sterile Supply		///////	///////		//////	//////	Supp11			////	////			
DEL	Delivery & Labor Rooms		///////	///////		//////	//////	Supp11			////	////			
DIA	Dialysis					LABOR	LABOR	Supp11							
EDG	Electrodiaynosis							Supp12			BUDGET				
LAB	Laboratory							Supp 9							
NMD	Nuclear Medicine							Supp11			////	////			
ORR	Operating & Recovery Rooms		///////	///////		//////	//////	Supp11			////	////			
OPM	Other Physical Medicine					LABOR1	LABOR1	Supp11			////	////			
PHM	Pharmacy		///////	///////		//////	//////	Supp 8			////	////			
PHT	Physical Therapy							Supp11			////	////			
RAD	Radiology Diagnostic							Supp10			BUDGET				
RSP	Respiratory Therapy							Supp11			////	////			
THR	Therapeutic Radiology							Supp11			BUDGET				
CCA	CARDIAC CATHETERIZATION							Supp11			////	////			

Hospital Number [ ][ ][ ][ ]

SHARE - 1976 ACTUAL
COST CENTER DATA

C Page 2 of 2.

Hospital:

	COST CENTER	Hours: Employees	Hours: Physicians Salaries	Hours: Physicians Fees	Salaries: Empl.	Salaries: Phys.	Phys. Fees	Supp.	Costs (000): Cont. Serv.	Oth. Exp.	Dep. & Fac. Int	Lease Cost	Exp. Rec.	Total Cost	Costs 1976 Projected
PHY	Physicians Coverage					LABOR 1		Supp1	////	0th 2	////	////			
RSD	Residents							Supp1	////	0th 2	////	////			
A&G	Administrative & General		/////	/////		/////	/////	Supp1	0th 2	0th 2	////	////			
DTY	Dietary		/////	/////		/////	/////	Supp 3							
FIS	Fiscal		/////	/////		/////	/////	Supp 4	0th 2	0th 2	BUDGET				
HKP	Housekeeping		/////	/////		/////	/////	Supp 1	0th 2	0th 2					
L&L	Laundry and Linen		/////	/////		/////	/////	Supp 5	0th 2	0th 2	////	////			
MAL	Malpractice Insurance	//////	/////	/////	////	/////	/////	Supp 6	0th 1	0th 2	BUDGET				
MRD	Medical Records		/////	/////	/////	/////	/////	////	////	0th 2	////	////			
PCC	Patient Care Coordination				LABOR 1	LABOR 1	LABOR 1	Supp 2	0th 2	0th 2	////	////			
PLT	Plant		/////	/////	/////	/////	/////	Supp 1	0th 2	0th 2	////	////			
UTC	Utilities Cost	//////	/////	/////	////	/////	/////	Supp 7	0th 3	0th 2	CAPITAL FACILITIES				
OGS	Other General Services		/////	/////	LABOR 1	/////	/////	////	////	BUDGET	////	////			
EDR	Education and Research				LABOR 1	LABOR 1	LABOR 1	Supp 1	0th 2	0th 2	////	////			
LFB	Legal Fringe Benefits	//////	/////	/////	////	/////	/////	Supp 2	0th 2	0th 2	////	////			
PFB	Policy Fringe Benefits	//////	/////	/////	////	/////	/////	////	////	LABOR 2	////	////			
PEN	Pensions	//////	/////	/////	////	/////	/////	////	////	LABOR 2	////	////			
INT	Interest	//////	/////	/////	////	/////	/////	////	////	LABOR 2	////	////			
BCT	Blue Cross Total				////	/////	/////	////	////	OTH 3	CAPITAL FACILITIES	////			
RIT	Reconciling Items														
TOT	Total Institution														

LABOR 1 (spans PHY through MAL)

LABOR 1 (spans PCC through OGS)

APPORTIONED (spans A&G through TOT)

C. Case-Mix Volume Projections

In order to develop an overall patient care budget for interim hospital payment and for determination of the fully prospective Institutional Cost payment budget, it was necessary to project patient volume by DRG. This had to be done even though only a year's DRG data was available. Therefore data on volumes of patients by service were accumulated over a longer period of time and disaggregated into DRGs.

The "Facilities Compliment and Patient Data Yearly Summary" which includes each hospital's admissions by clinical service by quarter for January 1973 to December 1977, served as the primary source of admission statistics. This historical data was used to determine trends in volumes for four classes of DRGs and patients:

1. Pediatrics
2. Maternity
3. Psychiatry
4. Medical/Surgical

A breakdown of these clinical service classes by DRG is presented in the Fifth Quarter Report pp. 33-34. The patient volume points were plotted along a trend or regression line, a separate line for each patient class for each of the four yearly quarters in order to control for the effects of seasonality. (For example, the first quarter's admissions for Pediatrics for 1973 were compared with the first quarter's admissions for 1974 and so forth.) In order to place greater value upon the most recent data (1977), the actual value for a given quarter in 1977 was compared with the overall trend of the data, and the difference between the two points was applied to the 1978 projection for each quarter.

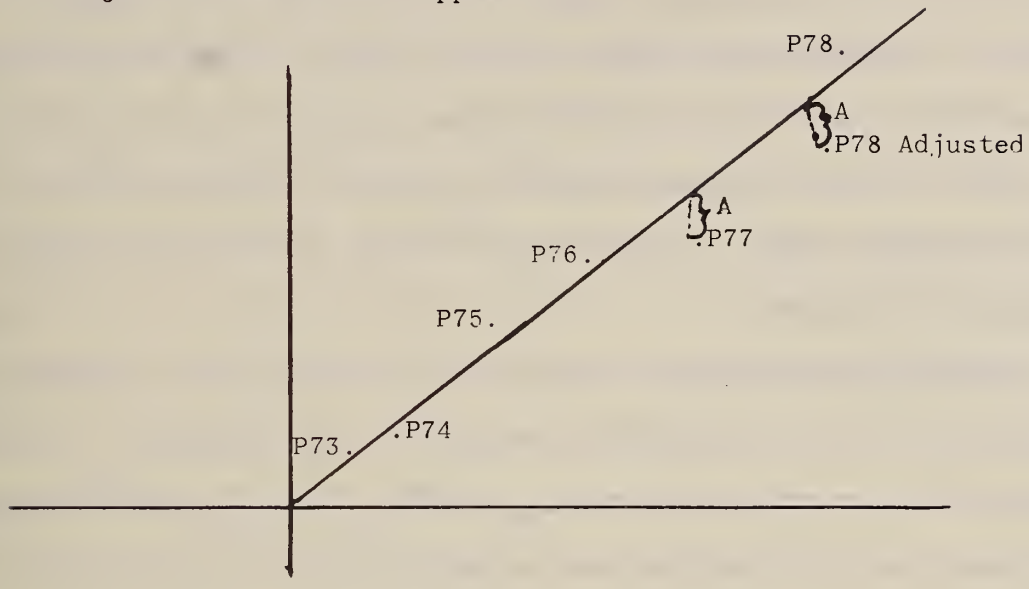
P78 - (P77 - A) = P78 adjusted

P78 = projected 1978 quarterly admissions on trend line

P77 = actual 1977 quarterly admissions

A = P 77 distance from trend line

P78 adjusted = P78 with A applied



In certain cases, individual data points or groups of data points were not relevant for plotting a trend line. Occasionally, more than one trend was noted in a set of quarterly data. For example, a hospital may have admitted the same number of Medical/Surgical cases for 1973 and 1974 but substantially increased its bed capacity the following year and showed a steady increase from 1975 on. In this case, only data from 1975 and following years were used for the 1978 projection. A second problem encountered was when a single data point appeared statistically abberrant from the trend such that the trend line was artificially shifted by one quarter's data. This 'bad" data point may have resulted from an epidemic, a period of hospital renovation, a hospital strike, etc. and was replaced by an average between the corresponding point for the year immediately preceding and immediately following the given year.

Once the final projection points for 1978 had been determined they were totaled across the four quarters to arrive at 1978 projected admission for each of the four services for each hospital. The ratio of this 1978 projection to the 1976 actual number of admissions $\frac{\text{P78 adjusted}}{\text{P76 actual}}$ was used to derive the percentage change for each of the four classes of patients. This percentage change was then applied to the 1976 discharge figure for each DRG (See Section III-A-3-b) grouped within the service. The number of projected patient days for 1978 was determined from the hospital average length of stay for each DRG in 1976 times the projected admissions for the DRG.

Following each hospital's review of its 1978 patient volume and day projections, limited adjustments were made for some hospitals. In two hospitals which had been experiencing steadily increasing patient volumes, the trend line projection for 1978 surpassed their bed capacity. Two hospitals which planned to expand their bed capacities in 1978 had low 1978 projections based upon past trends compared with the hospitals' projections. A few hospitals experienced case-mix shifts, i.e., a significant change in patient volume for a particular clinical service. When applicable, projections were adjusted. In a few instances, patient days were too high. One major reason for this was the fact that some hospitals had opened an inpatient same-day surgery unit after 1976. Therefore, although these patients were included in 1977 admissions data and hence 1978 projections, no abstracts or bills had been submitted for them in 1976. Their length-of-stay was projected at the previously established average for the DRG rather than as one day, thus greatly inflating the total patient day figure. Therefore, these patients were segregated from the DRG costs.

However, even after these adjustments, length of stay differences existed for some hospitals, indicating overall length of stay changes or case-mix shifts within a clinical service class. A 1978 New Jersey Blue Cross fraction was derived from the 1978 SHARE budgeted New Jersey Blue Cross admissions over total budgeted admissions and was applied to the total patient volume (The New Jersey Blue Cross case-mix was determined for 1976 from abstract data normalized to actual number of cases. See Section III.A.3.) This fraction had to be adjusted in several instances. One major problem was hospital reporting discrepancies. After reviewing New Jersey Blue Cross data for 1975 through 1977, it was determined that the New Jersey Blue Cross SHARE reported figure often included Federal Employee Program and HOST admissions, federal and out-of-state Blue Cross patients reimbursed through New Jersey Blue Cross, hence this figure was often too high or too low. Once the total figure was adjusted, the New Jersey Blue Cross number was reconciled. Also, the primary payor designation on the medical abstracts was derived from admission data and did not differentiate between Blue Cross plans. Both of these factors contributed to the error rate in identifying New Jersey Blue Cross patients by DRG. Changes in coding procedures will eliminate this problem in the future. Medicaid and Medicare number of patients for 1976 and projections for 1978 were calculated in an equivalent manner.

It is recognized that all projections based on limited historical data are, at best, guesses. Therefore, differences between projected case-mix and actual experience will be adjusted on a quarterly basis for payment purposes. Furthermore, although all patients and days by payor are based on the abstract coding, payment of such patients will be subject to individual contract benefit limitations.

IV.D. PROSPECTIVE PAYMENT SYSTEM

1. Calculation of Payment

As described in Section II, a cost per case for each DRG is determined for each hospital and then equalized (as described in Section IV.A in order to compare the costs of DRGs across all patients and hosptials. The following 2 figures (included for each hospital with the DRG Model Run) present the distribution of costs per case by number of cases for all Participating Hospitals for DRG 112, Otitis Media, Chronic Mastoiditis, and Otosclerosis without Surgery, and DRG 79, Metabolic Diseases of Gout, Globulinopathy, and Xanthomatosis with Secondary Diagnosis. The figures readily show that the distribution of costs per case is much "tighter" for DRG 112 than for DRG 79. The dispersion about each DRG's mean is measured by the standard deviation [19] (SD on the figures) when compared with the mean, and the coefficient of variation, or the standard deviation divided by the mean. For each DRG the 1976 unequalized hospital's actual mean cost per case and equalized mean cost per case are presented on each hospital's schedule of rates by DRG. Next, a standard in 1976 equalized dollars is determined which is the mean actual cost allocated to treating patients of each DRG in all Participating Hospitals. In order to determine the payment rate per DRG the distribution of all patients within each DRG was examined and the coefficient of variation for each DRG was determined. This coefficient of variation is used as the percent of the hospital's cost used in the determination of the payment rate and one minus the coefficient of variation is the proportion of the standard. (The greater the dispersion, the higher the proportion of hospital cost.) For DRG 112 the proportion of hospital cost is 47.73%, or its standard deviation of $159.38

[19] The range above or below the mean for a normal distribution within which 68% of observations (patients) fall is termed the standard deviation.

HISTOGRAM 2

ALL HOSPITALS --- TOTAL COST
24NSD1 OTITIS MEDIA,CHRONIC MASTOIDITIS,OTOSCLEROSIS W/O OPER

GRP NUM	NUM PTS	TOTAL COST	MEAN COST	SD COST
112	215	71795	333.93	159.38

VALUE	FREQUENCY	PERCENT	CUMULATIVE	
0- 49	0	.0%	.0%	
50- 99	8	3.7%	3.7%	********
100- 149	8	3.7%	7.4%	********
150- 199	24	11.2%	18.6%	**********
200- 249	44	20.5%	39.1%	**********
250- 299	18	8.4%	47.4%	**********
300- 349	26	12.1%	59.5%	**********
350- 399	18	8.4%	67.9%	**********
400- 449	26	12.1%	80.0%	**********
450- 499	14	6.5%	86.5%	**********
500- 549	8	3.7%	90.2%	**********
550- 599	9	4.2%	94.4%	**********
600- 649	2	.9%	95.3%	*
650- 699	3	1.4%	96.7%	**
700- 749	4	1.9%	98.6%	***
750- 799	1	.5%	99.1%	
800- 849	0	.0%	99.1%	
850- 899	0	.0%	99.1%	
900- 949	1	.5%	99.5%	
950- 999	0	.0%	99.5%	
1000- 1049	1	.5%	100.0%	

ALL HOSPITALS --- TOTAL COST HISTOGRAM 3
15D1YD METABOLIC DIS OF GOUT,GLOBULINOPATHY,XANTHOMATOSIS W DX2

GRP NUM	NUM PTS	TOTAL COST	MEAN COST	SD COST
79	164	123287	751.75	513.06

VALUE	FREQUENCY	PERCENT	CUMULATIVE	
0- 49	0	.0%	.0%	
50- 99	0	.0%	.0%	
100- 149	1	.6%	.6%	*
150- 199	3	1.8%	2.4%	***
200- 249	4	2.4%	4.9%	****
250- 299	10	6.1%	11.0%	**********
300- 349	9	5.5%	16.5%	*********
350- 399	7	4.3%	20.7%	*******
400- 449	11	6.7%	27.4%	***********
450- 499	15	9.1%	36.6%	***************
500- 549	12	7.3%	43.9%	************
550- 599	6	3.7%	47.6%	******
600- 649	10	6.1%	53.7%	**********
650- 699	11	6.7%	60.4%	***********
700- 749	10	6.1%	66.5%	**********
750- 799	7	4.3%	70.7%	*******
800- 849	1	.6%	71.3%	*
850- 899	5	3.0%	74.4%	*****
900- 949	3	1.8%	76.2%	***
950- 999	8	4.9%	81.1%	********
1000- 1049	3	1.8%	82.9%	***
1050- 1099	4	2.4%	85.4%	****
1100- 1149	2	1.2%	86.6%	**
1150- 1199	1	.6%	87.2%	*
1200- 1249	1	.6%	87.8%	*
1250- 1299	0	.0%	87.8%	
1300- 1349	3	1.8%	89.6%	***
1350- 1399	0	.0%	89.6%	
1400- 1449	2	1.2%	90.9%	**
1450- 1499	0	.0%	90.9%	
1500- 1549	0	.0%	90.9%	
1550- 1599	2	1.2%	92.1%	**
1600- 1649	0	.0%	92.1%	
1650- 1699	1	.6%	92.7%	*
1700- 1749	1	.6%	93.3%	*
1750- 1799	2	1.2%	94.5%	**
1800- 1849	0	.0%	94.5%	
1850- 1899	1	.6%	95.1%	*
1900- 1949	0	.0%	95.1%	
1950- 1999	1	.6%	95.7%	*
2000- 2049	1	.6%	96.3%	*
2050- 2099	0	.0%	96.3%	
2100- 2149	1	.6%	97.0%	*
2150- 2199	0	.0%	97.0%	
2200- 2249	1	.6%	97.6%	*
2250- 2299	0	.0%	97.6%	
2300- 2349	0	.0%	97.6%	
2350- 2399	1	.6%	98.2%	*
2700- 2749	2	1.2%	99.4%	**
2750- 2799	0	.0%	99.4%	
2850- 2899	1	.6%	100.0%	*

divided by its mean across all patients of $333.93. The resultant Equalized 1976 Payment Rates are presented on the Schedule of Rates. These comparisons are made in 1976 equalized dollars and then converted by each hospital's Labor Unequalization Factor for each DRG (See Model Run Table 22 and Section IV.A) into the hospital's own labor market dollars for 1976 to arrive at Unequalized 1976 payment rate. (See Schedule of Rates by DRG.) To develop a prospective rate it is necessary to account for inflation between the 1976 reporting period and the current simulation year (1978). This is done by applying the hospital's projected Economic Factor for each DRG (See Model Run Table 28 and Section IV.B.) Because the rates are established from unit costs and standards, a projection of case load volume must be made in order to develop the overall budget for a hospital. Hence, the Projected 1976 Numbers of Patients for each DRG as shown on the Schedule of Rates and described in Section IV.C are multiplied by each DRG's Unequalized 1978 Payment Rate. Summing across the 383 DRGs and adding projected outlier costs ("DRGs" 384 to 393) to this sum, a prospective Patient Care payment budget is arrived at.[20]

For a hospital's Institutional Costs,a prospective payment budget was established in a similar fashion. Each institution's Institutional Costs standard is determined in equalized 1976 dollars and 1976 services levels (patient and residency position volumes) from the regression equation described in Section III.B.3. The hospital s actual Institutional Costs is the grand total of Institutional Cost Table 9 , "Equalized Inpatient Institutional Costs." The Institutional Cost payment budget is computed by a set proportion

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[20] For four hospitals inpatient Same Day Surgery (SDS) units are included in this patient care payment budget. Since no bills or abstracts were recieved for such patient units in 1976, projected costs were included in the payment budget at the average cost per live discharge for patients with less than a 24 hour stay of medical-surgical DRGs, increased for inflation times projected number of SDS patients.

of the institutional costs plus a complementary proportion of the standard dollars and unequalized as described in Section IV.A.

In order to derive the proportions for Institutional Costs which would be consistent with the initial overall system goal of 25/75 (See Section I.) The following calculation was performed:

Standard Proportion of Patient Care Costs	X	Patient Care of all 18 hospitals	+	Standard Proportion of Institutional Costs	+	Institutional Costs for all 18 hospitals	+	Capital Facilities Cost for all 18 hospitals	=	Standard Proportion for Overall Hospital Costs for all 18 hospitals	X	Overall Hospital Costs for all 18 hospitals

(.3437 X 221,000,000) + (Standard Proportion of Institutional Costs X 78,000,000) + 25,000,000 = .25 X 325,000,000

Standard Proportion of Institutional Costs = .065

The 1976 Institutional Cost payment is then adjusted for inflation to 1978 levels by use of the Institutional Cost economic factor as described in Section IV.B and shown on Institutional Cost Table 11. The payment is unequalized using the hospital specific unequalization factor (See Section IV.B and I.C Table 9). The payment is then adjusted for 1978 service volumes. The 1978 Institutional Cost volume adjustment is obtained by dividing the results from the regenerated regression equation using 1) 1976 patient care equalized dollars and 1978 projected case-mix, and 2) 1978 residents (inpatient proportion) by the results from the original equation which reflected 1976 service levels.

The payment budget of the third component of Hospital Costs, Capital Facilities Costs (See Section III.C) are included at the 1978 SHARE Approved

Payment Rate for purposes of the simulation.

Finally, all the hospital costs described above are converted to a per diem using 1978 projected patient days and added to the Hospital and Payor Cost Adjustments described in Section III.D. (which have also been converted to a per diem) in order to arrive at a per diem rate compariable to the SHARE rate-setting system for New Jersey Blue Cross patients. This per diem is then multiplied by New Jersey Blue Cross Patient days to determining the New Jersey Blue Cross patient's DRG budget.[21] This number, for your hospital, follows the Institutional Cost run.

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[21] New Jersey Blue Cross Patient's Days and Budgets would include the entire stay of any New Jersey Blue Cross patient regardless of contractual limitations and or dissallowances which will result in fewer actual New Jersey Blue Cross days and dollars.

2. Outliers and Utilization Review

Outliers are patients who display inordinate consumption of hospital resources when compared with patients who possess similar medical attributes as defined by the DRG patient classification system. Although outliers may be identified either by the cost of hospital services required or by the number of hospital days used, the current AUTOGRP Model defines DRGs according to length of stay. At present, therefore, length of stay is being used as a proxy measure of resource consumption. Those patients with an exceptionally long length of stay are identified as the medical abstracts are processed. For example, 50 percent of the total population within DRG 23, cancer of the breast with operation without secondary diagnosis, stayed 11 days or less in New Jersey hospitals during 1976. Patients whose length of stay exceeded 20 days were "trimmed" statistically from this DRG and classified as outliers. (See hospital case-mix reports for trim points.) Although only 1.8 percent of all patients in New Jersey were classified as outliers in 1976, outliers consumed more than 9 percent of all patient days in the state.

At present, the DRG Project's methodology does not include a means for determining reasonable cost and equitable reimbursement for outliers. These patient's hospital resource consumption pattern may have been necissitated medical characteristics which required treatment that deviated from the norm or by difficulty in placing the patient in a long-term care facility.

The DRG Project has proposed that hospitals be reimbursed for outliers at cost, as determined by the DRG cost allocation model. This would, of course, necessitate an intra-hospital review of these patients within the

hospital's existing utilization review system in order to justify the extended length of stay, and to identify those patients labeled as outliers because of coding errors. Each hospital would return the "Supplemental Patient Data Collection Form" providing an explanation for the outliers and any information to be corrected. (See Figure 12 .) Most outliers would normally be captured by current PAS and NJUP review systems for hospitals involved in comprehensive review of their patients regardless of federal sources of payment (See Fifth Quarter Report, p. 60.)

NEW JERSEY STATE DEPARTMENT OF HEALTH
HEALTH ECONOMICS SERVICES
DRG PROJECT

OUTLIERS DATA COLLECTION FORM

FIGURE 12

		HOSPITAL								HOSPITAL NUMBER		
PATIENT I.D. NO.	DRG	PRIMARY DIAGNOSIS	SECONDARY DIAGNOSIS	PRIMARY PROCEDURE	SECONDARY PROCEDURE	AGE	LENGTH OF STAY	DRG TRIM	PRIMARY SERVICE	PRIMARY PAYOR	UTILIZATION REVIEW	REASONS (Specify if Appropriate)
											Yes___ No___	

KEY FOR REASONS

1 = CODING ERROR PLEASE INDICATE ALL CORRECTIONS IN SHADED AREAS.

2 = MEDICAL JUSTIFICATION

3 = SNF PLACEMENT PROBLEM

4 = OTHER PLACEMENT PROBLEM (Specify)

5 = PRIMARY DIAGNOSIS FOR LENGTH OF STAY DIFFERS FROM PRIMARY DIAGNOSIS AT ADMISSION (Record LOS diagnosis under shaded Primary Diagnosis block.)

CHAIRMAN, UTILIZATION REVIEW COMMITTEE _____ DATE _____

PAGE OF PAGE

V. Management Reports

As a supplement to the simulation case-mix payment reports, Participating Hospitals are provided with Management Reports. These reports, which further explain the derivation of the simulated payment, furnish information which may serve as a tool for evaluating the performance of each hospital in comparison to the other Participating Hospitals. The reports are intended to be used as a means of identifying a hospital's practices which may require further investigation. They may also be used in a hospital's budgeting mechanism. Future reports will show changes over time for both case-mix and relative cost per case for each hospital.

The various Management Report tables illustrate the cost for each institution broken down by Major Diagnostic Category[22] (Report I), by cost centers (Report II), by DRG (Report III, III.A and IV), and by primary payor. The reports, while based upon 1976 data, are presented both in 1976 unequalized costs and case-mix volume (See Section III.A.3.b. for missing data estimation procedures),and in 1978 estimated unequalized costs and 1978 projected case-mix volumes. Both sets of reports compare a hospital's actual or estimated costs per DRG with standard costs. (The mean cost per case of the Participating Hospitals; see Section I.)

These standard costs have been unequalized to reflect the dollars of each hospital's labor market area. Variances are shown in terms of the amounts and the proportions by which a hospital's costs either are greater than (a negative variance) or less than (a positive variance) the standard cost. It should be noted that because of problems encountered with the merging of

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22 MDC, the 83 general disease categories from which the DRGs are formed.

mother and baby bills and abstracts (See Section III.A.3.a.) the standards and hospital costs for DRGs 278 - 282 and 318 - 321 may be misallocated for the mothers and babies; however, other Length of Stay comparisons are relevant for these DRGs.

For some purposes,the costs on the tables are aggregated across DRGs; nevertheless, standard variances are always computed at the DRG level for the case-mix of the hospital.

Finally, service groupings are used to present cost and include the following cost centers: Nursing Services - Cost Center (RNS, LPN, ATT, and CLR), Diagnostic Ancillary Services - Cost Center (CCA, EDG, LAB and RAD), Therapeutic Ancillary Services - Cost Center (BBK, CSS, DEL, DIA, ORR, OPM, PHM, PHT, RSP, and THR), Patient Care General Services - Cost Center (DTY, MRD, patient care portions of HKP and L&L).

Report I

Report I presents a "Case-Mix Cost Summary" of each hospital's overall performance for patient care costs. Each of the 83 MDCs is compared with the standard for total number of patients treated by the hospital. By referring to the total dollar variance (far right hand column) one may readily observe where the DRG system might have radical payment effects on a hospital. For instance, in the example presented on the following table, the example hospital has a substantial variance from the standard for MDC 031, Cerebrovascular Disease, for its 316 cases. The hospital was operating at some $40,000 above the standard for its case-mix of Cerebrovascular Disease in 1976. The vast majority of this variance is traceable to therapeutic ancillary services.

XSSDRGRP SEPTEMBER 5, 1978

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
REPORT I CASE-MIX COST SUMMARY

MAJOR DIAGNOSTIC CATEGORY	NUMBER OF CASES		NURSING SERVICES	DIAGNOSTIC ANCILLARY SERVICES	THERAPEUTIC ANCILLARY SERVICES	PATIENT CARE GENERAL SERVICES	TOTAL COST FOR ALL CASES
028 ARRYTHMIA & SLOWED CONDUCTIC N	236	TOTAL HOSPITAL COST	94448	45948	72899	38191	251486
		NJII STD FOR CASE-MIX	115891	55975	92736	47036	311638
		VARIANCE	21443	10027	19837	8845	60152
		% VARIANCE	18.50	17.91	21.39	18.80	19.30
029 HEART FAILURE	237	TOTAL HOSPITAL COST	126042	65995	58222	46818	297077
		NJII STD FOR CASE-MIX	128103	57024	51426	52068	288621
		VARIANCE	2061	-8971	-6796	5250	-8456
		% VARIANCE	1.61	-15.73	-13.22	10.08	-2.93
030 CARDITIS, VALVULAR & OTHER DIS	147	TOTAL HOSPITAL COST	67835	48631	29206	26559	172231
		NJII STD FOR CASE-MIX	75752	52037	37159	31350	196298
		VARIANCE	7917	3406	7953	4791	24067
		% VARIANCE	10.45	6.55	21.40	15.28	12.26
031 CEREBROVASCULAR DIS	316	TOTAL HOSPITAL COST	207896	93818	125580	91217	518511
		NJII STD FOR CASE-MIX	207176	75306	91809	103261	477552
		VARIANCE	-720	-18512	-33771	12044	-40959
		% VARIANCE	-0.35	-24.58	-36.78	11.66	-8.58
032 DIS OF VASCULAR SYSTEM	339	TOTAL HOSPITAL COST	137838	62761	113965	59847	374411
		NJII STD FOR CASE-MIX	161595	67547	127445	73181	429768
		VARIANCE	23757	4786	13480	13334	55357
		% VARIANCE	14.70	7.09	10.58	18.22	12.88
033 PULMONARY EMBOLISM	91	TOTAL HOSPITAL COST	50232	26719	15720	20054	112725
		NJII STD FOR CASE-MIX	56042	30429	21644	24689	132804
		VARIANCE	5810	3710	5924	4635	20079
		% VARIANCE	10.37	12.19	27.37	18.77	15.12
034 PHLEBITIS & THROMBOPHLEBITIS	89	TOTAL HOSPITAL COST	35791	14124	9360	17321	76596
		NJII STD FOR CASE-MIX	35291	14540	10641	18971	79443
		VARIANCE	-500	416	1281	1650	2847
		% VARIANCE	-1.42	2.86	12.04	8.70	3.58
035 HEMORRHOICS	76	TOTAL HOSPITAL COST	13630	5777	12444	8841	40692
		NJII STD FOR CASE-MIX	12008	5472	11628	8436	37544
		VARIANCE	-1622	-305	-816	-405	-3148
		% VARIANCE	-13.51	-5.57	-7.02	-4.80	-8.38
036 HYPERTROPHY OF TONSIL & ADEN OID	243	TOTAL HOSPITAL COST	9512	9933	27734	9205	56384
		NJII STD FOR CASE-MIX	10692	7533	30132	10206	58563
		VARIANCE	1180	-2400	2398	1001	2179
		% VARIANCE	11.04	-31.86	7.96	9.81	3.72

Report II

Report II presents total "Patient Services Cost by Cost Center"; the opposite perspective by which to view hospital's patient services. In the computation of this table, the standard for each DRG was broken into the proportion of the 15 cost centers which the 18 hospitals utilize in the treatment of each DRG. Applying these standard proportions to the case-mix of each hospital, standards are developed by cost center.

The two right hand columns of Report II present, in relative terms, the amount of the hospital's patient care dollars going to each cost center and group of cost centers in comparison to the distribution of the standard patient care dollars for the hospital case-mix. It may be noted that, in general, the example hospital's overall mode of patient treatment is similar to the 18 hospitals as a whole. However, a large variance exists for the cost center, Other Physical Medicine, where the hospital, for its case-mix, spends more than twice the standard in occupational, speech, and radiation therapy.

Other major negative variances may be noted in Laboratory, Diagnostic Radiology, Delivery, and Respiratory Therapy; however similarly large positive variances exist for electrodiagnosis, blood bank, operating room and dietary. Each variance may be attributed to either operating efficiency or inefficiency within a department, or to a different mode of treating its case-mix from the other Participating Hospitals.

XSSDRGRP SEPTEMBER 5, 1978

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
REPORT II TOTAL PATIENT SERVICE COST BY COST CENTER

COST CENTER	TOTAL UNEQUALIZED HOSPITAL COST PER COST CENTER INCLUDED OUTLIERS	TOTALS	TOTAL HOSPITAL COST AT NJII STANDARD	DOLLAR VARIANCE	% VARIANCE	% OF TOTAL HOSPITAL PATIENT CARE COST BY COST CENTER	% OF TOTAL COST BY PATIENT CARE COST CENTER IN NJII HOSPITAL FOR COMPARABLE CASE-MIX
RNS REGISTERED NURSING SERVICES	3077372	434475 3511847					
LPN LICENSED PRACTICAL NURSING	1265373	178711 1444084					
ATT NURSING ATTENDANTS	633818	89450 723268					
CLR UNIT CLERICAL SERVICES	849607	119938 969545					
TOTAL NURSING SERVICE	5826170	822574 6648744	6580481	-68263	-1.04	40.05	39.61
CCA CARDIAC CATHETERIZATION	58773	1832 60605	55092	-5513	-10.01	0.37	0.33
EDG ELECTRODIAGNOSIS	144048	6950 150998	175120	24122	13.77	0.91	1.05
LAB LABORATORY	1487601	179059 1666660	1598194	-68466	-4.28	10.04	9.62
NMD NUCLEAR MEDICINE	130876	12331 143207	125813	-17394	-13.83	0.86	0.76
RAD RADIOLOGY DIAGNOSTIC	655069	63745 718814	661140	-57674	-8.72	4.33	3.98
TOTAL DIAGNOSTIC ANCILLARY	2476367	263917 2740284	2615359	-124925	-4.78	16.51	15.74
BBK BLOOD BANK	35453	2467 37920	107223	69303	64.63	0.23	0.65
CSS CENTRAL & STERILE SUPPLY	1118502	163585 1282087	1317473	35386	2.69	7.72	7.93
DEL DELIVERY & LABOR ROOMS	274864	5314 280178	236944	-43234	-18.25	1.69	1.43
DIA DIALYSIS	0	0 0	0	0	0.0	0.0	0.0
ORR OPERATING & RECOVERY ROOMS	974572	40870 1015442	1096498	81056	7.39	6.12	6.60
OPM OTHER PHYSICAL MEDICINE	74135	25020 99205	42078	-57127	-135.76	0.60	0.25
PHM PHARMACY	742592	189945 932537	932937	30400	3.26	5.44	5.62
PHT PHYSICAL THERAPY	82655	31521 114176	108078	-6098	-5.64	0.69	0.65
RSP RESPIRATORY THERAPY	366816	66780 433596	349874	-83722	-23.93	2.61	2.11
THR THERAPEUTIC RADIOLOGY	15142	8843 23985	21072	-2913	-13.82	0.14	0.13
TOTAL THERAPUTIC ANCILLARY	3684781	504345 4189126	4212177	23051	0.55	25.23	25.36
DTY DIETARY	1204430	167027 1371457	1595089	223632	14.02	8.26	9.60
HKP HOUSEKEEPING	762862	87923 850785	835340	-15445	-1.85	5.12	5.03
L&L LAUNDRY & LINEN	468255	56608 524863	484616	-40247	-8.30	3.16	2.92
MRD MEDICAL RECORDS	252072	25106 277178	289392	12214	4.22	1.67	1.74
TOTAL GENERAL SERVICES	2687619	336664 3024283	3204437	180154	5.62	18.22	19.29
TOTAL HOSPITAL PATIENT CARE	14674937	1927500 16602437	16612454	10017	0.06	100.00	100.00

Report IV presents the 10 DRGs for which the hospital has the greatest positive total variance and the 10 DRGs with the greatest negative total variances. The example of the latter highlights DRG 144, stroke without operation with a major secondary diagnoses from MDC 031. It can be seen that some $34,000 of the $40,000 variance from the mode for the MDC may be attributed to this single DRG. Furthermore, it may be seen that this DRG does not have a problem with Length of Stay. In fact the hospital's Length of Stay is 17.8 days as opposed with 18.5 days for the standard. Nevertheless, the hospital's average cost per case is some $298 greater than the standard for this DRG.

The ranking of the 10 DRGs in which the hospital treated their set of patients with greater cost efficiency (the 10 highest DRGs p.191) highlights their cardiovascular services. This is unlikely to be a random occurence of disease. The cost variance is supported by considerable variances in Length of Stay by comparison with the other hospitals. The cost efficiency is at least in part due to the variable Length of Stay treatment pattern. This is indicative of the particular mode of practice of the cardiovascular physicians and specialists in this institution.

XSSDRGRP SEPTEMBER 6, 1978

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
REPORT 1V HIGH VARIANCE DRGS

DRG	DESCRIPTION		AVERAGE LOS	AVERAGE COST	--NUMBER OF -- CASES		TOTAL COST FOR ALL CASES IN DRG		% OF TOTAL PATIENT CARE COSTS	
TEN LOWEST RANKED BY TOTAL DOLLAR VARIANCE FROM NJII AVEREGE										
278	DELIVERY WO OP OR W OP ASSISTING DELIVERY	HOSPITAL	4.6	473	HOSPITAL	1264	HOSPITAL	598790	HOSPITAL	4.08
		STANDARD	3.9	493	HOSP %	6.42	NJII AVE.	509795	NJII	3.47
		VARIANCE	-0.6	-73	NJII %	0.60	VARIANCE	-88955		
		% VARIANCE	-16.16	-17.37			% VARIANCE	-17.46		
318	NORMAL FULL TERM NEW BORN	HOSPITAL	4.8	647	HOSPITAL	1719	HOSPITAL	425343	HOSPITAL	2.90
		STANDARD	4.2	621	HOSP %	8.73	NJII AVE.	379655	NJII	2.58
		VARIANCE	-0.6	-26	NJII %	0.82	VARIANCE	-45688		
		% VARIANCE	-13.40	-11.76			% VARIANCE	-12.03		
144	BRAIN-HEMORRHAGE(STROKE) WO OPER W MAJOR DX2	HOSPITAL	17.8	2130	HOSPITAL	114	HOSPITAL	243525	HOSPITAL	1.66
		STANDARD	18.5	2330	HOSP %	0.58	NJII AVE.	209547	NJII	1.43
		VARIANCE	0.7	-270	NJII %	0.05	VARIANCE	-33978		
		% VARIANCE	3.88	-10.21			% VARIANCE	-16.21		
227	DIS OF GALLBLADDER & BILE DUCT W OPER WO DX2	HOSPITAL	11.0	1110	HOSPITAL	156	HOSPITAL	174563	HOSPITAL	1.19
		STANDARD	10.1	921	HOSP %	0.79	NJII AVE.	143604	NJII	0.98
		VARIANCE	-0.9	-197	NJII %	0.07	VARIANCE	-30959		
		% VARIANCE	-9.00	-21.39			% VARIANCE	-21.56		
228	DIS OF GALLBLADDER & BILE DUCT W OPER W DX2 W AGE <65	HOSPITAL	14.1	1469	HOSPITAL	94	HOSPITAL	138105	HOSPITAL	0.94
		STANDARD	12.1	1174	HOSP %	0.48	NJII AVE.	110336	NJII	0.75
		VARIANCE	-2.0	-295	NJII %	0.04	VARIANCE	-27769		
		% VARIANCE	-16.40	-25.13			% VARIANCE	-25.17		
348	FRAC OF BONE W AMPUTATION,RESTORATION OF HIP JOINT,OTH MAJ OPER	HOSPITAL	24.0	2990	HOSPITAL	125	HOSPITAL	261340	HOSPITAL	1.78
		STANDARD	19.9	1691	HOSP %	0.63	NJII AVE.	236390	NJII	1.61
		VARIANCE	-4.1	-299	NJII %	0.06	VARIANCE	-24950		
		% VARIANCE	-20.88	-15.02			% VARIANCE	-10.55		
094	ALCOHOLISM W LIVER CIRRHOSIS,DELIRIUM TREMENS OR OTHER MAJOR DX2	HOSPITAL	12.0	1013	HOSPITAL	50	HOSPITAL	50665	HOSPITAL	0.35
		STANDARD	7.6	644	HOSP %	0.25	NJII AVE.	32215	NJII	0.22
		VARIANCE	-4.4	-369	NJII %	0.02	VARIANCE	-18450		
		% VARIANCE	-58.01	-57.33			% VARIANCE	-57.27		
339	FRAC(SPINE,RIB,BONE OF UPPER ARM)WO OPER W AGE >64	HOSPITAL	16.3	1257	HOSPITAL	54	HOSPITAL	67892	HOSPITAL	0.46
		STANDARD	12.1	926	HOSP %	0.27	NJII AVE.	50018	NJII	0.34
		VARIANCE	-4.1	-331	NJII %	0.03	VARIANCE	-17874		
		% VARIANCE	-34.08	-35.73			% VARIANCE	-35.74		
340	FRAC(THIGH BONE,PELVIS,MULTIPLE)WO OPER	HOSPITAL	20.6	1591	HOSPITAL	58	HOSPITAL	80690	HOSPITAL	0.55
		STANDARD	15.0	1091	HOSP %	0.29	NJII AVE.	63294	NJII	0.43
		VARIANCE	-5.5	-500	NJII %	0.03	VARIANCE	-17396		
		% VARIANCE	-36.66	-27.50			% VARIANCE	-27.48		

XSSDRGRP SEPTEMBER 6, 1978

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
REPORT IV HIGH VARIANCE DRGS

DRG	DESCRIPTION		AVERAGE LOS	AVERAGE COST	--NUMBER OF -- CASES		TOTAL COST FOR ALL CASES IN DRG		% OF TOTAL PATIENT CARE COSTS	
TEN HIGHEST RANKED BY TOTAL DOLLAR VARIANCE FROM NJII AVERAGE										
153	DIS OF VASCULAR SYST	HOSPITAL	18.8	2148	HOSPITAL	77	HOSPITAL	165461	HOSPITAL	1.13
	EM W ARTERY RECONSTR	STANDARD	24.7	2724	HOSP %	0.39	NJII AVE.	209729	NJII	1.43
	UCTION,AMPUTATION EX	VARIANCE	5.9	576	NJII %	0.04	VARIANCE	44268		
	TREMITY	% VARIANCE	23.97	21.15			% VARIANCE	21.11		
121	DIS-HEART,MYOCARDIAL	HOSPITAL	13.8	1007	HOSPITAL	248	HOSPITAL	398772	HOSPITAL	2.72
	INFARCTION (ACUTE)	STANDARD	16.5	1780	HOSP %	1.26	NJII AVE.	441496	NJII	3.01
		VARIANCE	2.7	173	NJII %	0.12	VARIANCE	42724		
		% VARIANCE	16.27	9.72			% VARIANCE	9.68		
131	DIS-HEART,IRREG HEAR	HOSPITAL	11.4	1944	HOSPITAL	54	HOSPITAL	104991	HOSPITAL	0.72
	T RYTHM,SLOW CONDUCT	STANDARD	15.3	2654	HOSP %	0.27	NJII AVE.	143330	NJII	0.98
	ION W INSERTION OF E	VARIANCE	3.9	710	NJII %	0.03	VARIANCE	38339		
	LEC HEART DE	% VARIANCE	25.62	26.75			% VARIANCE	26.75		
124	DIS-HEART,ISCHEMIA (	HOSPITAL	8.5	913	HOSPITAL	244	HOSPITAL	222789	HOSPITAL	1.52
	BLOOD DEFICIENCY) EX	STANDARD	10.6	1047	HOSP %	1.24	NJII AVE.	255516	NJII	1.74
	C AMI(DRG121) WC OPE	VARIANCE	2.1	134	NJII %	0.12	VARIANCE	32727		
	R W MAJOR DX	% VARIANCE	19.64	12.80			% VARIANCE	12.81		
138	DIS-HEART,INFLAMMATI	HOSPITAL	18.6	2224	HOSPITAL	17	HOSPITAL	37817	HOSPITAL	0.26
	ON,VALVE PROB W VALV	STANDARD	20.7	3302	HOSP %	0.09	NJII AVE.	56140	NJII	0.38
	E OPER OR OTHER MAJO	VARIANCE	2.1	1078	NJII %	0.01	VARIANCE	18323		
	R OPER	% VARIANCE	10.17	32.65			% VARIANCE	32.64		
294	ARTHRITIS W REPAIR &	HOSPITAL	19.2	1969	HOSPITAL	64	HOSPITAL	127311	HOSPITAL	0.87
	RESTORATION (JOINT,	STANDARD	21.6	2267	HOSP %	0.33	NJII AVE.	145114	NJII	0.99
	HIP) REM MEMBRANE BE	VARIANCE	2.4	278	NJII %	0.03	VARIANCE	17803		
	TWEEN VERTEB	% VARIANCE	11.34	12.26			% VARIANCE	12.27		
011	CA-GI SYST W OPER(GA	HOSPITAL	21.8	2494	HOSPITAL	119	HOSPITAL	296667	HOSPITAL	2.02
	STRIC RES,COLON RES,	STANDARD	24.7	2642	HOSP %	0.60	NJII AVE.	314393	NJII	2.14
	ESOPHAGUS RES)	VARIANCE	2.9	148	NJII %	0.06	VARIANCE	17526		
		% VARIANCE	11.73	5.60			% VARIANCE	5.57		
204	ABD HERNIA W AGE >64	HOSPITAL	6.1	598	HOSPITAL	98	HOSPITAL	58696	HOSPITAL	0.40
	W MIN REPAIR OPER	STANDARD	8.0	720	HOSP %	0.50	NJII AVE.	71378	NJII	0.49
		VARIANCE	1.9	150	NJII %	0.05	VARIANCE	12682		
		% VARIANCE	24.17	17.66			% VARIANCE	17.77		
382	SPECIAL ADMISSION W	HOSPITAL	2.6	337	HOSPITAL	332	HOSPITAL	111962	HOSPITAL	0.76
	BLADDER VISUALIZATIO	STANDARD	3.2	373	HOSP %	1.69	NJII AVE.	123999	NJII	0.84
	N,REMOVAL FIXED DEVI	VARIANCE	0.5	36	NJII %	0.16	VARIANCE	12037		
	CE(INTERNAL)	% VARIANCE	17.21	9.65			% VARIANCE	9.71		

The hospital's 114 cases of DRG 144 ranks 35th among the hospital's DRG by number of admissions in Report III. Similarily, DRG 144, is the 35th most prevalent DRG across the 18 hospitals. In contrast, the total of nearly a quarter of a million dollars expended on this type of case represented the 7th greatest committment of the hospital's resource to a DRG but only the 10th greatest for the 18 hospitals.

The table also begins to illustrate the derivation of the $298 variance per case. Of this amount, the $233 per case is found in therapeutic ancillary services.

This table can also be used to highlight the hospital's commitment to the treatment of certain types of case-mix. Two columns compare the ranking of each of the DRGs in the hospital and across all participating hospitals by number of patients and by total cost. The first nine or ten DRGs are the most revealing. The second example of ReportIII displays the Case-Mix of a suburban institution focusing on historectomies, cataracts, even tonsillectomies. The third example comes from an inner city teaching hospital with a large number of pulmonary diseases in the younger age groups. The marked differences in Case-Mixes reveal interesting information concerning the community which the hospital services and the mission of the institution.

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
REPORT III PATIENT SERVICE COSTS PER DRG BY COST CENTER

DRG	DESCRIPTION	NUMBER	HOSP RANK	NJII RANK	AVG LOS		AVERAGE COST PER CASE BY COST CENTER CLASS--- NURSING SERVICES	DIAGNOSTIC ANCILLARY	THERAPEUTIC ANCILLARY	GENERAL SERVICES	AVERAGE TOTAL	HOSP COST RANK	NJII COST RANK	TOTAL COST FOR ALL CASES
350	DISLOCATION(JAW,HIP) SPRAINS(KNEE,SACROIL IAC,OTH UNSPEC)WO OP ER	132	28	17	9.9	HOSP AVG	293.	68.	98.	175.	633.	38	19	83511.
					9.6	NJII STD	262.	80.	99.	174.	614.			81105.
					-0.3	VARIANCE	-30.	12.	1.	-1.	-18.			-2406.
					-3.11	% VAR	-11.46	14.77	1.18	-0.63	-2.97			-2.97
348	FRAC OF BONE W AMPUT ATION,RESTORATION OF HIP JOINT,OTH MAJ O PER	125	29	20	24.0	HOSP AVG	970.	242.	545.	333.	2091.	5	5	261340.
					19.9	NJII STD	795.	237.	562.	297.	1891.			236390.
					-4.1	VARIANCE	-175.	-5.	17.	-36.	-200.			-24950.
					-20.88	% VAR	-22.00	-2.32	2.95	-12.01	-10.55			-10.55
011	CA-GI SYST W OPER(GA STRIC RES,COLON RES, ESOPHAGUS RES)	119	30	42	21.8	HOSP AVG	882.	391.	873.	349.	2495.	4	8	296867.
					24.7	NJII STD	954.	405.	864.	420.	2642.			314393.
					2.9	VARIANCE	72.	14.	-9.	70.	147.			17526.
					11.74	% VAR	7.54	3.36	-1.00	16.80	5.57			5.57
123	DIS-HEART,ISCHEMIA (BLOOD DEFICIENCY) EX C AMI(DRG121) WO OPE R W MINOR DX	119	31	24	9.5	HOSP AVG	387.	194.	86.	178.	845.	26	17	100555.
					9.5	NJII STD	387.	194.	85.	177.	844.			100386.
					0.0	VARIANCE	0.	-0.	-1.	-1.	-1.			-169.
					0.03	% VAR	0.00	-0.10	-0.72	-0.34	-0.17			-0.17
271	ABORTION WO DX2	118	32	9	1.1	HOSP AVG	35.	24.	79.	37.	175.	201	45	20653.
					1.5	NJII STD	50.	39.	105.	51.	245.			28884.
					0.4	VARIANCE	15.	16.	26.	13.	70.			8231.
					26.36	% VAR	29.75	40.00	24.49	26.66	28.50			28.50
093	ALCOHOLISM WO DX2 OR W MINOR DX2	115	33	102	8.0	HOSP AVG	266.	96.	61.	141.	564.	59	181	64905.
					7.2	NJII STD	234.	112.	60.	155.	562.			64597.
					-0.7	VARIANCE	-31.	16.	-1.	14.	-3.			-308.
					-10.33	% VAR	-13.37	14.54	-1.92	8.72	-0.48			-0.48
125	DIS-HEART,ISCHEMIA (BLOOD DEFICIENCY) EX C AMI(DRG121) W CARD IAL CATH	114	34	123	5.2	HOSP AVG	238.	352.	57.	143.	790.	34	111	90069.
					5.8	NJII STD	290.	351.	88.	152.	881.			100463.
					0.6	VARIANCE	52.	-1.	31.	9.	91.			10394.
					9.52	% VAR	17.81	-0.20	35.07	6.20	10.35			10.35
144	BRAIN-HEMORRHAGE(STR OKE) WO OPER W MAJOR DX2	114	35	35	17.3	HOSP AVG	849.	323.	596.	378.	2136.	7	10	243526.
					18.5	NJII STD	821.	245.	353.	420.	1838.			209547.
					0.7	VARIANCE	-29.	-78.	-233.	41.	-298.			-33979.
					3.37	% VAR	-3.47	-31.79	-66.12	9.88	-16.22			-16.22
109	DIS-EYE W SURG PROC(MUSCLE SURG REPAIR O F EYELID)OTHER SURG PROC	113	36	56	2.1	HOSP AVG	63.	26.	150.	58.	297.	133	194	33532.
					2.1	NJII STD	63.	32.	164.	58.	316.			35748.
					-0.0	VARIANCE	-0.	6.	14.	0.	20.			2216.
					-0.26	% VAR	-0.16	18.85	8.25	0.31	6.20			6.20

NEW JERSEY DEPARTMENT OF HEALTH
DRG PROJECT
REPORT III PATIENT SERVICE COSTS PER DRG BY COST CENTER

DRG	DESCRIPTION	NUMBER	HOSP RANK	NJII RANK	AVG LOS		AVERAGE COST PER CASE BY COST CENTER CLASS				AVERAGE TOTAL	HOSP COST RANK	NJII COST RANK	TOTAL COST FOR ALL CASES
							NURSING SERVICES	DIAGNOSTIC ANCILLARY	THERAPEUTIC ANCILLARY	GENERAL SERVICES				
318	NORMAL FULL TERM NEW BORN	1719	1	1	4.8	HOSP AVG	147.	15.	12.	74.	247.	2	3	425342.
					4.2	NJII STD	95.	14.	55.	57.	221.			379655.
					-0.6	VARIANCE	-52.	-0.	43.	-17.	-27.			-45687.
					-13.39	% VAR	-54.91	-1.97	78.13	-30.55	-12.03			-12.03
278	DELIVERY WO OP OR W CP ASSISTING DELIVERY	1264	2	2	4.6	HOSP AVG	148.	12.	209.	106.	474.	1	2	598790.
					3.9	NJII STD	128.	23.	157.	96.	403.			509795.
					-0.6	VARIANCE	-20.	11.	-51.	-10.	-70.			-88995.
					-16.16	% VAR	-15.94	48.93	-32.62	-10.26	-17.46			-17.46
382	SPECIAL ADMISSION W BLADDER VISUALIZATION,REMOVAL FIXED DEVICE(INTERNAL)	332	3	23	2.6	HOSP AVG	83.	57.	136.	60.	337.	20	73	111962.
					3.2	NJII STD	98.	53.	149.	73.	373.			124000.
					0.5	VARIANCE	15.	-5.	13.	13.	36.			12038.
					17.26	% VAR	15.59	-8.67	8.65	17.18	9.71			9.71
266	DIS OF FEMALE GEN ORG W REMOVAL WOMB,REPAIR FEM GEN ORG,MAJ OPER	284	4	8	8.6	HOSP AVG	330.	105.	266.	134.	835.	8	7	237020.
					8.7	NJII STD	309.	101.	293.	138.	842.			239011.
					0.1	VARIANCE	-21.	-4.	28.	4.	7.			1991.
					1.09	% VAR	-6.81	-3.63	9.47	2.85	0.83			0.83
110	DIS-EYE W SURG PROC (REMOVAL OF LENS,OR SCLERA -INCISION INT O SCLERA)	282	5	13	4.5	HOSP AVG	142.	37.	214.	90.	483.	15	22	136269.
					5.0	NJII STD	151.	53.	215.	97.	516.			145645.
					0.5	VARIANCE	9.	16.	0.	8.	33.			9376.
					10.88	% VAR	5.95	30.56	0.21	7.83	6.44			6.44
282	DELIVERY W COMPLICATION W CESAREAN SECTION	254	6	12	6.7	HOSP AVG	297.	37.	274.	120.	728.	10	12	184928.
					7.0	NJII STD	337.	49.	221.	136.	743.			188745.
					0.3	VARIANCE	40.	12.	-53.	16.	15.			3817.
					4.56	% VAR	11.88	24.39	-23.80	11.60	2.02			2.02
121	DIS-HEART,MYOCARDIAL INFARCTION (ACUTE)	248	7	7	13.8	HOSP AVG	773.	313.	264.	258.	1608.	3	1	398773.
					16.5	NJII STD	908.	295.	267.	310.	1780.			441496.
					2.7	VARIANCE	135.	-18.	3.	53.	172.			42723.
					16.28	% VAR	14.89	-6.26	1.07	16.96	9.68			9.68
124	DIS-HEART,ISCHEMIA (BLOOD DEFICIENCY) EXC AMI(DRG121) WO OPER W MAJOR DX	244	8	5	8.5	HOSP AVG	423.	208.	108.	174.	913.	9	4	222790.
					10.6	NJII STD	507.	208.	110.	222.	1047.			255517.
					2.1	VARIANCE	84.	0.	2.	49.	134.			32727.
					19.63	% VAR	16.50	0.09	1.65	21.84	12.81			12.81
159	TONSILS-ADENOIDS ENLARGEMENT	243	9	4	1.2	HOSP AVG	39.	41.	114.	38.	232.	74	36	56384.
					1.5	NJII STD	44.	32.	125.	42.	243.			59128.
					0.3	VARIANCE	5.	-9.	11.	4.	11.			2744.
					19.07	% VAR	11.30	-27.94	8.66	10.45	4.64			4.64

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HCFA PROJECT
REPORT III PATIENT SERVICE COSTS PER DRG BY COST CENTER

DRG	DESCRIPTION	NUMBER	HOSP RANK	NJII RANK	AVG LOS		AVERAGE COST PER CASE BY COST CENTER CLASS--- NURSING SERVICES	DIAGNOSTIC ANCILLARY	THERAPEUTIC ANCILLARY	GENERAL SERVICES	AVERAGE TOTAL	HOSP COST RANK	NJII COST RANK	TOTAL COST FOR ALL CASES
318	NORMAL FULL TERM NEW BORN	703	1	1	4.7	HOSP AVG	192.	92.	168.	134.	466.	1	3	328926.
					4.2	NJII STD	95.	14.	55.	57.	221.			155251.
					-0.5	VARIANCE	-29.	-13.	-113.	-77.	-247.			-173675.
					-10.71	% VAR	-15.55	-124.99	-206.13	-135.42	-111.87			-111.87
278	DELIVERY W/O CPLX W CP ASSISTING DELIVERY	517	2	2	4.8	HOSP AVG	122.	32.	161.	135.	451.	5	2	233030.
					3.9	NJII STD	178.	23.	157.	96.	403.			208358.
					-0.1	VARIANCE	5.	-9.	-4.	-40.	-48.			-24672.
					-2.00	% VAR	4.07	-41.52	-2.56	-41.25	-11.84			-11.84
169	BRONCHITIS W AGE <56	363	3	22	5.5	HOSP AVG	204.	60.	77.	140.	461.	9	49	167417.
					5.7	NJII STD	1 [illegible]	58.	87.	111.	443.			160894.
					-0.3	VARIANCE	-16.	17.	9.	-29.	-18.			-6523.
					-13.82	% VAR	-8.38	29.76	10.70	-25.82	-4.05			-4.05
C04	INFECT DIS (VIRAL DIS,VD,MENINGITIS) W CX2	321	4	11	6.6	HOSP AVG	220.	84.	48.	146.	498.	10	16	159890.
					5.4	NJII STD	210.	117.	65.	122.	519.			166585.
					-1.4	VARIANCE	-4.	33.	16.	-24.	21.			6695.
					-5.41	VAR	-1.88	28.27	25.28	-19.97	4.02			4.02
265	DIS OF FEMALE GEN OR B W DEC,VISCALIZATION,OTH SURG PROC W CX2	299	5	3	3.5	HOSP AVG	109.	67.	234.	100.	511.	11	18	150734.
					3.1	NJII STD	96.	62.	136.	67.	363.			107153.
					-0.4	VARIANCE	-13.	-5.	-98.	-34.	-148.			-43581.
					-14.44	% VAR	-13.05	-7.97	-69.52	-50.72	-40.67			-40.67
172	ASTHMA W AGE <31	237	6	61	5.3	HOSP AVG	207.	42.	70.	117.	437.	23	138	103628.
					5.0	NJII STD	201.	55.	95.	100.	452.			107233.
					-0.4	VARIANCE	-6.	13.	25.	-17.	15.			3605.
					-7.37	% VAR	-3.01	23.56	26.54	-17.11	3.36			3.36
122	DIS-HEART,ISCHEMIA (BLEED DEFICIENCY) EX CERT AMI(DRG 121) W/O OPER W/O CX2	231	7	55	5.6	HOSP AVG	210.	203.	47.	139.	605.	13	66	139770.
					5.4	NJII STD	214.	170.	59.	136.	678.			156666.
					1.2	VARIANCE	58.	-34.	12.	-3.	73.			16896.
					18.23	% VAR	21.20	-19.79	19.72	-2.07	10.78			10.78
169	PNEUMONIA W AGE <31	229	8	44	8.3	HOSP AVG	272.	57.	82.	176.	596.	15	43	135940.
					6.7	NJII STD	242.	75.	88.	135.	542.			123544.
					-1.3	VARIANCE	-30.	9.	7.	-41.	-54.			-12396.
					-19.25	% VAR	-13.19	11.91	7.68	-30.00	-10.03			-10.03
132	DIS-HEART,FAILURE (EX CPLX FUNCTION) W/O OPER	223	9	11	13.7	HOSP AVG	524.	306.	205.	302.	1393.	3	6	300615.
					11.5	NJII STD	499.	210.	177.	213.	1106.			237861.
					-2.3	VARIANCE	-67.	-96.	-28.	-89.	-292.			-62754.
					-19.67	% VAR	-17.42	-41.73	-14.52	-41.76	-26.38			-26.38

The variance in therapeutic ancillaries for DRG 144 is further located through the cost center breakdown of Report III.A. "Patient Service Costs by DRG by Cost Center," also represented by number of cases in the DRG. Please note, that given the inexactitudes in the case-mix cost finding methodology, such refined breakdowns should be employed only where large variances appear. (Perhaps, greater than 10-20% and $10 per case on the RCCAC, for the items in the cost center typically consumed for the case-type should be explored.) While large negative variances may be noted for laboratory/blood bank, radiology, and respiratory therapy, the vast majority of the variance, $187 per case, may be found in Other Physical Medicine. Extended over the 114 cases of DRG 144, more than $20,000 of the initial variances for MDC 031 and the OPM cost center have been located. As noted in Section I.A , the example hospital is providng a rehabilitative stroke program, the effectiveness and appropriateness of which has raised a question for the health care community to answer regarding the DRGs standard.

DRG PROJECT

REPORT IIIA PATIENT SERVICE COSTS BY DRG BY COST CENTER

DRG NO.	HOSP RANK		AVERAGE COST PER CASE BY COST CENTER																	
			CCA	EDG	LAB	NMD	RAD	BBK	CSS	DEL	DIA	ORR	OPM	PHM	PHT	RSP	THR	CTY	HKP	L&L	MRD
123	31	HOSP AVG	6	27	104	9	46	0	32	0	0	0	0	31	2	17	0	97	40	23	15
		STANDARD	7	27	104	9	47	1	32	0	0	1	1	31	2	18	0	98	41	24	15
		VARIANCE	1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	1	1	1	0
		% VAR	14.3	0.0	0.0	0.0	2.1	100.0	0.0	0.0	0.0	100.0	100.0	0.0	0.0	5.6	0.0	1.0	2.4	4.2	0.0
271	32	HOSP AVG	0	0	21	0	1	0	25	0	0	48	0	3	0	1	0	10	12	6	8
		STANDARD	0	0	34	0	5	1	33	0	0	62	0	8	0	1	0	19	15	7	8
		VARIANCE	0	0	13	0	4	1	8	0	0	14	0	5	0	0	0	9	3	1	0
		% VAR	0.0	0.0	38.2	0.0	80.0	100.0	24.2	0.0	0.0	22.6	0.0	62.5	0.0	0.0	0.0	47.4	20.0	14.3	0.0
93	33	HOSP AVG	0	5	61	5	24	3	15	0	0	0	0	13	2	24	0	72	35	19	13
		STANDARD	0	8	72	8	25	4	24	0	0	1	0	23	1	8	0	77	48	17	13
		VARIANCE	0	3	11	3	1	1	9	0	0	1	0	10	-1	-16	0	5	13	-2	0
		% VAR	0.0	37.5	15.3	37.5	4.0	25.0	37.5	0.0	0.0	100.0	0.0	43.5	-100.0	-200.0	0.0	6.5	27.1	-11.8	0.0
125	34	HOSP AVG	250	21	57	1	20	0	27	0	0	2	0	15	0	11	0	47	43	40	11
		STANDARD	195	32	69	3	53	0	53	0	0	2	0	24	0	8	0	60	48	33	12
		VARIANCE	-55	11	12	2	33	0	26	0	0	0	0	9	0	-3	0	13	5	-7	1
		% VAR	-28.2	34.4	17.4	66.7	62.3	0.0	49.1	0.0	0.0	0.0	0.0	37.5	0.0	-37.5	0.0	21.7	10.4	-21.2	8.3
144	35	HOSP AVG	0	13	183	29	95	22	116	0	0	0	234	91	59	60	0	225	79	50	23
		STANDARD	0	22	144	22	56	4	114	0	0	1	47	93	54	40	0	273	76	46	25
		VARIANCE	0	9	-39	-7	-39	-18	-2	0	0	1	-187	2	-5	-20	0	48	-3	-4	2
		% VAR	0.0	40.9	-27.1	-31.8	-69.6	-450.0	-1.8	0.0	0.0	100.0	-397.9	2.2	-9.3	-50.0	0.0	17.6	-3.9	-8.7	8.0
109	36	HOSP AVG	0	2	17	0	6	0	32	0	0	107	0	9	0	1	0	18	18	12	8
		STANDARD	0	3	22	0	7	0	41	0	0	111	0	11	0	1	0	22	18	11	8
		VARIANCE	0	1	5	0	1	0	9	0	0	4	0	2	0	0	0	4	0	-1	0
		% VAR	0.0	33.3	22.7	0.0	14.3	0.0	22.0	0.0	0.0	3.6	0.0	18.2	0.0	0.0	0.0	18.2	0.0	-9.1	0.0
167	37	HOSP AVG	0	11	179	12	65	0	103	0	0	0	7	119	3	102	0	101	51	28	16
		STANDARD	0	14	145	10	46	7	72	0	0	1	1	102	3	98	0	124	48	26	18
		VARIANCE	0	3	-34	-2	-19	7	-31	0	0	1	-6	-17	0	-4	0	23	-3	-2	2
		% VAR	0.0	21.4	-23.4	-20.0	-41.3	100.0	-43.1	0.0	0.0	100.0	-600.0	-16.7	0.0	-4.1	0.0	18.5	-6.3	-7.7	11.1
211	38	HOSP AVG	0	4	32	0	9	0	34	0	0	86	0	8	0	3	0	25	22	14	8
		STANDARD	0	3	35	0	10	0	44	0	0	82	0	14	0	1	0	38	24	15	9
		VARIANCE	0	-1	3	0	1	0	10	0	0	-4	0	6	0	-2	0	13	2	1	1
		% VAR	0.0	-33.3	8.6	0.0	10.0	0.0	22.7	0.0	0.0	-4.9	0.0	42.9	0.0	-200.0	0.0	34.2	8.3	6.7	11.1
88	39	HOSP AVG	0	7	39	7	26	3	22	0	0	0	0	25	0	0	0	142	65	35	21
		STANDARD	0	7	39	9	19	1	26	0	0	2	0	33	0	1	0	142	82	29	20
		VARIANCE	0	0	0	2	-7	-2	4	0	0	2	0	8	0	1	0	0	17	-6	-1
		% VAR	0.0	0.0	0.0	22.2	-36.8	-200.0	15.4	0.0	0.0	100.0	0.0	24.2	0.0	100.0	0.0	0.0	20.7	-20.7	-5.0
264	40	HOSP AVG	0	3	33	0	8	0	28	0	0	64	0	4	0	2	0	13	15	8	8
		STANDARD	0	3	36	0	9	1	32	0	0	71	0	7	0	2	0	20	17	9	8
		VARIANCE	0	0	3	0	1	1	4	0	0	7	0	3	0	0	0	7	2	1	0
		% VAR	0.0	0.0	8.3	0.0	11.1	100.0	12.5	0.0	0.0	9.9	0.0	42.9	0.0	0.0	0.0	35.0	11.8	11.1	0.0

Report VI provides "DRG Costs by Primary Payor" such that differences in patient treatment costs for different classes of patients within a DRG may be observed. For DRG 144, costs per case are higher for Blue Cross and Commercial Insurance patients than for the more elderly Medicare cases (it may be conjectured that more extensive rehabilitative therapy is conducted for cases with the greatest potential for recovery thereby resulting in higher costs). Finally, Report V summarizes the costs and variances for the entire case-mix of each of the payors.

	TOTAL FOR DRG				BLUE CROSS			MEDICARE			MEDICAID			COMM-OTHER		
DRG	NO. IN DRG	HOSP AVG. LOS	NJII LOS	COST PER CASE	STD PER CASE	NO. IN DRG	AVG. LOS	COST PER CASE	NO. IN DRG	AVG. LOS	COST PER CASE	NO. IN DRG	AVG. LOS	COST PER CASE	NO. IN DRG	AVG. LOS	COST PER CASE
3	140	4.0	4.3	382	354	67	4.0	332	3	7.6	768	2	3.0	203	66	3.7	358
322	138	3.9	4.8	43[illegible]	435	67	3.9	435	17	[illegible].2	429	0	0.0	0	54	3.9	424
305	135	3.6	3.7	397	438	63	3.6	407	14	[illegible].3	411	3	3.[illegible]	371	55	3.5	384
193	132	4.8	5.4	453	533	59	5.1	471	3	[illegible].7	421	0	0.0	0	70	4.6	439
350	132	9.8	9.6	631	614	51	10.3	646	15	5.4	550	0	0.0	0	68	9.8	636
348	125	24.5	19.9	2145	1891	17	21.5	1824	90	24.5	2213	0	0.0	0	18	27.6	2106
11	119	21.5	24.7	2456	2642	21	23.1	2686	76	21.3	2373	0	0.0	0	22	21.0	2529
123	119	9.5	9.5	844	844	33	9.5	844	67	9.5	844	0	0.0	0	19	9.5	844
271	118	1.1	1.5	173	245	51	1.1	180	0	0.0	0	5	1.0	121	62	1.2	172
93	115	8.1	7.2	570	562	41	7.5	534	15	8.1	571	2	1.0	115	57	8.7	611
125	114	5.3	5.8	793	881	5[illegible]	5.1	732	23	5.8	857	0	0.0	0	41	5.2	770
144	114	17.5	18.5	2097	1838	18	19.9	2395	83	16.8	1995	2	5.5	1442	9	22.0	2605
109	113	2.1	2.1	298	316	57	2.0	281	[illegible]	[illegible].5	441	2	1.0	203	43	2.3	289
167	113	11.5	11.6	1274	1148	12	9.5	932	84	12.[illegible]	1274	0	0.0	0	17	10.2	1514
211	113	3.5	4.6	345	396	60	3.6	356	[illegible]	[illegible].[illegible]	333	2	5.0	415	50	3.2	330
88	107	15.9	13.5	998	891	39	14.9	945	20	20.3	1252	5	13.4	806	43	15.1	950
264	107	1.7	2.3	251	288	51	1.6	240	8	[illegible].1	333	5	2.0	217	43	1.6	246
355	107	3.0	4.[illegible]	308	368	30	2.5	261	0	[illegible].0	0	7	4.6	412	70	3.1	317
295	102	11.7	11.9	779	714	44	11.3	726	13	14.4	958	0	0.0	0	45	11.2	777
90	98	16.5	15.9	1[illegible]44	1[illegible]74	54	15.[illegible]	954	[illegible]	15.7	978	5	11.4	922	30	20.2	1229
274	98	6.0	8.1	606	728	3	6.3	593	[illegible]	[illegible].[illegible]	610	0	0.0	0	1	3.0	278
62	97	3.2	3.1	378	387	45	3.1	371	15	[illegible].5	388	1	2.0	284	36	3.4	384
248	97	0.5	2.3	227	325	46	[illegible].6	234	0	[illegible].0	0	3	0.0	188	48	0.4	222

ORG PROJECT

REPORT V PRIMARY PAYOR CASE-MIX COST SUMMARY

PRIMARY PAYOR	NUMBER OF CASES		NURSING SERVICES	DIAGNOSTIC ANCILLARY	THERAPEUTIC ANCILLARY	PATIENT CARE GENERAL	TOTAL COST FOR ALL CASES
BLUE CROSS	7582	TOTAL HOSPITAL COST	1899827	772145	1213220	916766	4801958
		NJII FOR CASE-MIX	1869953	755949	1273156	977138	4896196
		VARIANCE	-9874	-16196	59936	60372	94238
		% VARIANCE	-0.52	-2.14	4.71	6.18	1.92
MEDICARE	4532	TOTAL HOSPITAL COST	2103709	969345	1335068	887092	5295214
		NJII FOR CASE-MIX	2050038	866625	1202739	934733	5034135
		VARIANCE	-73671	-102720	-132329	47641	-261079
		% VARIANCE	-3.63	-11.85	-11.00	5.10	-5.19
MEDICAID	372	TOTAL HOSPITAL COST	100985	41635	59705	47854	250179
		NJII FOR CASE-MIX	96341	37339	58635	49873	242188
		VARIANCE	-4644	-4296	-1070	2019	-7991
		% VARIANCE	-4.82	-11.51	-1.82	4.05	-3.30
COMMERCIAL-OTHER	7204	TOTAL HOSPITAL COST	1719900	696380	1085425	833161	4334866
		NJII FOR CASE-MIX	1741575	691529	1173302	906029	4512435
		VARIANCE	21675	-4851	87877	72868	177569
		% VARIANCE	1.24	-0.70	7.49	8.04	3.94
SUB TOTALS	19690	TOTAL HOSPITAL COST	5824421	2479505	3693418	2684873	14682217
		NJII FOR CASE-MIX	5757907	2351442	3707832	2867773	14684954
		VARIANCE	-66514	-128063	14414	182900	2737
		% VARIANCE	-1.16	-5.45	0.39	6.38	0.02
OUTLIERS	480		823754	214723	414629	277235	1730341
TOTALS	20170		6648175	2694228	4108047	2962108	16412558

VI. FUTURE

A. ReAUTOGRPing

Three hundred and eighty three diagnosis related groups (DRGs) were used for setting the 1978 simulated rates. These DRGs were developed using data from New Jersey hospitals for the first six months of 1976, and additional data from non-New Jersey hospitals. Length of stay was used as a proxy for relative resource consumption and patient groups were developed based on their medical conditions and their statistical length of stay tendencies. The process of developing these patient groups, using a special computer language called AUTOGRP, is described in detail in the Project's Annual Report and AUTOGRP Patient Classification Scheme for Length of Stay.

After using these 383 DRGs for almost two years, certain improvements have been suggested for some of the current DRGs. In addition a more sensitive indicator of relative resources consumption has become available for the 18 Participating Hospitals - allocated cost per patient. Given these two facts, the current 383 DRGs will be modified, or reAUTOGRPed. Every attempt is now being made to have these new DRGs established for use in setting the January 1979 rates.

Some of the specific improvements suggested are as follows:

1. For some DRGs a cost differential was discovered among payors - Blue Cross, Medicare, Medicaid, and all others. These differentials were not uniform across DRGs nor across payors. A suggested explanation for a Medicare differential is the fact that Medicare patients are, by definition, older than the other payors' usual patients.

This would result in complications due to old age affecting the relative resource consumption of these patients within a DRG. A solution to this problem is to consider age as a more significant determinant of a patient's DRG than it is now in the DRGs where a Medicare differential exists.

An explanation for the Medicaid differential is that Medicaid patients tend to come from lower socio-economic classes than the other payors' usual patients. While lower socioeconomic status itself is a social problem, not a medical one, complicating factors such as dietary difficiencies or inadequate previous medical attention may be associated with this group as a whole. Thus, these patients may enter the hospital in generally poorer health resulting in a differential in resource utilization compared with other groups of patients. A partial solution to the reimbusement problem may be to identify these specific secondary diagnoses likely to be present in this group and likely to effect resource utilization on a DRG specific basis. These diagnoses could then be used to identify appropriate modifications required in the DRGs.

2. In certain groups of DRGs where patients require specialized technology or expertise, and the technology and expertise are regionalized, transfer of patients from community hospitals to regional center hospitals occurs frequently. Since a patient appears in the DRG system

on discharge, transfered patients may appear twice in the same DRG. For example, the patient may appear once with a short length of stay before transfer, and once with a normal to long length of stay after transfer. If the reimbursement standard is based on the mean across all hospitals, then the community hospital would tend to be over reimbursed for a transfer and the referral center hospital would tend to be under reimbursed.

As a solution to this problem, transfer status (transferred in, transferred out, no transfer) can be used to modify the reimbursement standard for a DRG so that separate standards can be appropriately calculated.

3. In order to examine the effectiveness of the DRGs, analyses of variance were performed to examine the effectiveness of the DRGs within a major diagnostic category (MDC). The current 383 DRGs accounted for 42% of the total variance in length of stay across the 1.1 million patients discharged in 1976 (omitting outliers). However, the percent of variance acccunted for within each MDC varied considerably. When examining total cost rather than length of stay, the 383 DRGs accounted for 41% of the variance (omitting outliers) and, once again, the results for each MDC varied considerably.

These analyses of variance were used to identify MDCs where the DRGs do not represent acceptably different groups of patients. These MDCs will be reAUTOGRPed to determine if any improvement is possible and, if so, new DRGs will be formed.

4. When the current 383 DRGs were developed, patients who died were eliminated from the process as being atypical users of hospital resources. This resulted in some DRGs having very different costs for patients who lived and patients who died. Since reimbursement cannot vary with death, the DRGs must be developed with deaths included in the processing. This will result in DRGs where both groups of patients consumed the same relative amounts of resource.

5. The current 383 DRGs are now screened for outliers based on abnormally long lengths of stay. An outlier is a patient whose measure of resource use is extremely abnormal compared with all other patients in a DRG. Now that cost data is available, outliers can be detected with abnormally high or low cost. This will improve the accuracy of the DRG cost per case standard.

   This improvement in outlier identification can take place for any set of DRGs now that patient cost data is available. As a result, this improvement will be made for all DRGs, not just any new ones developed.

B. Allocating Nursing Costs for 1979 Rate-Setting

The 1978 nursing weights were generated as an interim measure utilizing the application of the Q-Sort methodology by staff from 21 Participating Hospitals as discussed in Section III.A.2.b of this manual. This technique allowed the allocation of general nursing costs for cases in ICU and ACU on a DRG specific basis.

As a means to develop 1979 nursing weights, data reflecting normative nursing time for direct nursing care by skill level by shift by nursing intervention were collected for approximately 3,500 patients at three Participating Hospitals over a three-month period. Regression analysis was employed as a means to predict normative nursing intensity by skill level for the length of stay, thereby permitting identification of day-of-stay sensitive nursing weights for the 83 Major Diagnostic Categories (MDCs). MDCs were used to provide sample sizes adequate to generate nursing weights. These weights were then used as statistics for allocating direct care nursing costs by skill level from 1977 SHARE actuals.

C. Labor Cost Equalization

As described in Section IV.A the 1978 simulation payment utilized the labor cost equalization methodology presently employed by the SHARE rate-setting system. Throughout the past year hospitals have indicated concerns regarding this methodology including:

1) classification of hospitals within regions

2) lack of consideration for labor mix.

In order to address these and other concerns a new methodology is being considered utilizing salary information from the SHARE H-1 form, and fringe data and alternative salary regions including labor markets established by the New Jersey Department of Labor and Industry (largely based on the Federal Government SMSAs) and HSA areas. In addition, classification within each of the proposed regions based upon the criteria such as teaching and level of urbanization are being considered. The revised methodology will attempt to provide neither incentives or disincentives with regard to unionization of hospital skill mix.

It is anticipated that this refined methodology, upon approval of the HCAB, will be incorporated into both the SHARE and Case-mix Reimbursement rates for 1979.

D. Economic Factor

Presently the New Jersey Department of Health has developed an economic factor that relates price changes for selected proxies to hospital expenditures as described in Section IV.B. The New Jersey Hospital Association, through the work of Dr. John Rossman et. al. of HANYS, has proposed a factor similar to that developed by the Department, although differences do exist, primarily in the aggregation of labor and the choice of proxies for drugs and medical/surgical supplies.

In order to reconcile the two factors, an Ad Hoc Economic Factor Committee composed of representatives from the New Jersey Hospital Association, Department of Health, the DRG Task Force, New Jersey Blue Cross, Prudential Insurance Company, and the Council on Hospital Reimbursement has been established. DRG Project Staff in conjunction with the New Jersey Hospital Association are examaming:

1) means of reconciling the choice of proxies to be used for drugs and medical/surgical supplies
2) alternative proxies for those no longer available due to revisions to Bureau of Labor Statistics Indices
3) projection techniques to be used for 1979

Following review and approval of the results of these efforts, the revisions may be included in the development of 1979 payment rates.

APPENDIX A
DRG COST MODEL

To avoid ambiguity, cost centers before the overhead cost allocation will be called initial cost centers. Those that remain after the allocation will be called final cost centers.

First, define A_{ijh} to be the actual cost of cost category j in initial cost center i of hospital h. The total cost of initial cost center i for hospital h is A_{ih}

$$A_{ih} = \sum_{j} A_{ijh}$$

The salaries of hospital personnel are supplemented by fringe benefits which include legal fringe benefits, policy fringe benefits and pensions. Thus, the salaries cost in each cost center must be appropriately adjusted to reflect the cost of fringe benefits. This is done by calculating a fringe factor which will inflate the salaries cost to include fringe benefits cost. Let τ_{jh} be the fringe factor of cost category j in hospital h. (For non-salary cost categories, the fringe factor will simply be 1.0.) In the cost model, each initial cost center is first multiplied by the fringe factor to arrive at a fringe benefits adjusted cost for the initial cost center, B_{ijh}.

$$B_{ijh} = (A_{ijh})(\tau_{jh})$$

One of the cost categories is expense recoveries which are offsets to the total cost of the initial cost center. For each initial cost center, the cost center's expense recovery must be distributed to the other cost categories based on the proportion of the cost in each cost category to the total cost of the initial cost center. The result for

each of the hospital's initial cost centers is a fringe benefits and expense recovery adjusted cost for each cost category, λ_{ijh}.

$$B^*_{ih} = \sum_{j \in R} B_{ijh} \quad \left(\forall\, j \in R\right)$$

$$\lambda_{ijh} = B_{ijh} + \left[\frac{B_{ijh}}{\sum_{j \notin R} B_{ijh}}\right] \left(B^*_{ih}\right) \quad \left(\forall\, j \notin R\right)$$

where R is all expense recovery cost categories.

The costs as reported include both inpatient and non-inpatient costs. Since only inpatients are being processed through the model, inpatient costs must be identified before they can be allocated to the patients. To do this, the costs of each initial cost center are multiplied by an inpatient ratio to arrive at an inpatient cost for each cost category of the initial cost center.

Mathematically,

$$\theta_{ijh} = \left(w_{ih}\right)\left(\lambda_{ijh}\right)$$

where w_{ih} is the inpatient ratio of initial cost center i of hospital h and θ_{ijh} is the inpatient cost of cost category j in inital cost center i of hospital h which is also adjusted for fringe benefits and expense recovery.

Since physician salaries and physician fees in most of the ancillary cost centers are not comparable across hospitals due to differences in contractual arrangements (except for Blood Bank and Laboratory), their costs are removed from their respective initial cost centers and moved to a dummy initial cost center APH. This is done so that these costs

will not be allocated to the DRGs but can still be identified. As a result of this movement of physician costs to APH, Θ_{ijh} becomes T_{ijh}.

The costs in the initial cost centers must be allocated to the final cost centers using a standard step down or analogous allocation procedure. (See Section A, p. 222 for the mathematical description of the allocation method used.) The result of the allocation procedure will be a set of allocation fractions.

Let P^{f}_{ikh} be the fraction of initial cost center i's cost that is allocated to non-patient care related final cost center k in hospital h. Thus,

$$C'_{ikh} = (T_{ih})(P^{f}_{ikh})$$

and

$$C'_{ih} = \sum_{k} C'_{ikh}$$

where for hospital h, C'_{ikh} is the non-patient care related cost of initial cost center i allocated to final cost center k and C'_{ih} is the non-patient care related cost of initial cost center i which will not be spread to the DRGs.

Conversely, let P^{V}_{ikh} be the fraction of cost of initial cost center i that is allocated to patient care-related final cost center k in hospital h. Thus,

$$C_{ikh} = (T_{ih})(P^{V}_{ikh})$$

and

$$C_{ih} = \sum_{k} C_{ikh}$$

where for hospital h, C_{ikh} is the patient care-related cost of initial cost center i allocated to final cost center k and C_{ih} is the patient care related cost of initial cost center i which will be spread to the DRGs.

The total patient care-related cost in each final cost center is

$$C_{kh} = \sum_i C_{ikh}$$

and the fraction of final cost center k's cost which originated in initial cost center i is

$$\gamma_{ikh} = \frac{C_{ikh}}{C_{kh}}$$

It follows that

$$\sum_i \gamma_{ikh} = 1$$

Associated with each final cost center is a measure of resource use which will be used to allocate the final cost center's costs to the DRGs. Each patient will have a value for each resource use measure (e.g., length of stay, individual charge items, nursing itensity measures, etc.). Let $X_{k\ell gh}$ be the measure of resource use in final cost center k of hospital h by patient ℓ belonging to DRG g. Then,

$$D_{kgh} = \sum_{\ell} X_{k\ell gh}$$

and

$$D_{kh} = \sum_g D_{kgh}$$

where for hospital h, D_{kgh} is the amount of resource use in final cost center k by all patients in DRG g and D_{kh} is the total amount of resource use in final cost center k across all DRGs. The basic assumption being made is that the resource use measure for each final cost center is a valid indication of the relative amount of the resources of that final cost center that each patient consumes.

The number of patient records actually used in the DRG cost allocation process may be less than the actual number of discharges because of missing abstracts, missing bills, etc. It is assumed that the patient records available are a valid random sample of all patients. Define the following:

N_h^d = actual total number of patients in hospital h

N_{gh}^m = number of patients with merged records belonging to DRG g in hospital h

N_{gh}^a = number of patients with abstracts belonging to DRG g in hospital h

Merged records are those for which the abstract and bill have been linked together. Operationally, the percentage of abstracts available will be equal to or greater than the percentage of merged records. The average value of the resource use measure for final cost center k and DRG g for all merged records is

$$\frac{D_{kgh}}{N_{gh}^m}$$

By the normalization of the number of abstracts in each DRG, the best estimate of the actual number of patients treated in DRG g in hospital h can be obtained by

$$\hat{N}_{gh} = \frac{N^a_{gh}}{\sum_g N^a_{gh}} \left(N^d_h \right)$$

Since $\hat{N}_{gh}$ can be, and probably is, a real number, it is transformed to an integer, N^{est}_{gh} to more feasibly reflect the number of patients. The process of converting $\hat{N}_{gh}$ to N^{est}_{gh} utilizes an integerization algorithm which desirably contains the property that

$$\sum_g N_{gh} = \sum_g N^{est}_{gh}$$

The integerization algorithm used in the model is described in Section B, p. 226 .

Thus, for hospital h, the best estimate of the total resource use in final cost center k by DRG g is

$$S_{kgh} = \frac{D_{kgh}}{N^m_{gh}} \left(N_{gh} \right)$$

and $$S_{kh} = \sum_g S_{kgh}$$

is the estimated total resource use for final cost center k. The ratio of cost to resource use of final cost center k in hospital h is

$$R_{kh} = \frac{C_{kh}}{S_{kh}}$$

Thus, the cost of providing service of final cost center k to DRG g in hospital h is

$$C_{kgh} = \left(R_{kh} \right) \left(S_{kgh} \right)$$

For hospital h, the unit cost of DRG g in final cost center k is simply

$$U_{kgh} = \frac{C_{kgh}}{N^{est}_{gh}}$$

Furthermore, the unit cost of DRG g in initial cost center i is

$$U_{igh} = \sum_{k} \left[\left(\gamma_{ikh} \right) \left(U_{kgh} \right) \right]$$

and

$$U_{gh} = \sum_{i} U_{igh}$$

Since there are wide variations in the cost of labor across the state, and the goal of the model is to produce results by which the cost performances of hospitals can be compared at the DRG level in order to establish reimbursement rates, it is necessary to adjust for these labor costliness differences before meaningful comparisons can be made. To adjust for geographic wage differences, define α_{ijh} to be the labor equalization factor for cost category j in initial cost center i of hospital h. Thus,

$$E_{ijh} = \left(\alpha_{ijh} \right) \left(T_{ijh} \right)$$

and

$$E_{ih} = \sum_{j} E_{ijh}$$

where E_{ih} is the total cost of initial cost center i of hospital h adjusted for geographic wage differences.

An equalization factor for geographic wage differentials for each initial cost center, α_{ih}, can be calculated by weighting the equalization factor for each cost category by the fraction of cost in each cost category summed over all cost categories.

$$\alpha_{ih} = \sum_j \left[\left(\frac{T_{ijh}}{T_{ih}}\right)\left(\alpha_{ijh}\right)\right] = \sum_j \frac{E_{ijh}}{T_{ih}} = \frac{E_{ih}}{T_{ih}}$$

The initial cost center equalization factor, α_{ih}, can be used to convert the unit cost of a DRG from actual costs to costs equalized for geographic wage differentials.

$$U^e_{igh} = \left(\alpha_{ih}\right)\left(U_{igh}\right)$$

and

$$U^e_{gh} = \sum_i \left[\left(\alpha_{ih}\right)\left(U_{igh}\right)\right]$$

where U^e_{gh} is the equalized unit cost of DRG g in hospital h.

Based on a comparison of the equalized DRG unit costs across hospitals, a standard payment rate for each DRG will be established. This DRG payment rate must be unequalized in order to establish a DRG payment rate reflecting each hospital's labor costliness of its geographic area. First, a labor unequalization factor is calculated for each initial cost center directly from the α_{ih}'s,

$$\beta_{ih} = \frac{1}{\alpha_{ih}} = \frac{T_{ih}}{E_{ih}}$$

The $\beta_{ih's}$ provide a means of unequalizing the individual initial cost center values for each hospital. However, the standard DRG payment rate will be established in terms of a single unit payment rate across all initial cost centers for the DRG. Thus, a single unequalization factor for each DRG for each hospital must be developed. Such an unequalization factor for each DRG may be obtained by weighting each β_{ih} for a hospital by the fraction of the equalized DRG unit cost in the corresponding initial cost center and summing over all initial cost centers.

$$\beta_{gh} = \sum_i \left[\left(\beta_{ih} \right) \left(\frac{U^e_{igh}}{U^e_{gh}} \right) \right] = \frac{U_{gh}}{U^e_{gh}}$$

where β_{gh} is the labor unequalization factor for DRG g in hospital h. Even though two hospitals may have the same labor equalization factors at the initial cost center level, their DRG unequalization factors may differ since they may have used different proportions of initial cost center resources to treat the same DRG. Note that if the standard DRG payment rate established for a DRG was exactly equal to the equalized unit cost of the hospital (i.e. U^e_{gh}), then the unequalized DRG payment rate would be identical to the hospital's actual unit cost.

$$\left(\beta_{gh} \right) \left(U^e_{gh} \right) = \sum_i \left[\left(\beta_{ih} \right) \left(U^e_{igh} \right) \right] = \sum_i \frac{U^e_{igh}}{\alpha_{ih}} = \sum_i U_{igh} = U_{gh}$$

In addition to labor equalization, the effects of anticipated inflation must also be taken into account. If Δ_{ijh} is defined as the estimated inflation factor of cost category j in initial cost center i of hospital h, then

$$T^p_{ijh} = (\Delta_{ijh})(T_{ijh})$$

and

$$T^p_{ih} = \sum_j T^p_{ijh}$$

where T^p_{ih} is the estimation of the inflated costs of initial cost center i in hospital h. An estimated inflation factor for each initial cost center, Δ_{ih}, can be calculated by weighting the estimated inflation factors for each cost category by the fraction of costs in each cost category summed over all cost categories.

$$\Delta_{ih} = \sum_j \left[\left(\frac{T_{ijh}}{T_{ih}}\right)\left(\Delta_{ijh}\right)\right]$$

$$= \frac{\sum_j T^p_{ijh}}{T_{ih}} = \frac{T^p_{ih}}{T_{ih}}$$

The initial cost center estimated inflation factor, Δ_{ih}, can be used to convert the unit cost of a DRG from actual costs to estimated inflated costs by

$$U^p_{igh} = (\Delta_{ih})(U_{igh})$$

and

$$U^p_{gh} = \sum_i U^p_{igh}$$

where U^p_{gh} is the estimated inflated unit cost of DRG g in hospital h.

Once a standard rate for a DRG has been established and unequalized to reflect the hospital's region in terms of labor costliness, the hospital's payment rate must be adjusted for anticipated inflation. The $\Delta_{ih's}$ provide a means for inflating the initial cost center values for each DRG for each hospital. However, since the standard DRG payment

rate is in terms of a single unit payment rate encompassing all initial cost centers, a single estimated inflation factor for each DRG for each hospital must be calculated. Such an estimated inflation factor for each DRG may be obtained by weighting each Δ_{ih} by the fraction of actual unit cost in the corresponding initial cost center and summing over all initial cost centers.

$$\Delta_{gh} = \sum_i \left[\left(\Delta_{ih} \right) \left(\frac{U_{igh}}{U_{gh}} \right) \right] = \frac{U^p_{gh}}{U_{gh}}$$

where Δ_{gh} is the estimated inflation factor for DRG g in hospital h.

The previous discussion has emphasized the determination of the unit cost for the entire DRG. Additionally, the cost of treating each individual patient can be determined. The cost of providing the service of final cost center k to patient ℓ in DRG g in hospital h is

$$Y_{k\ell gh} = \left(R_{kh} \right) \left(X_{k\ell gh} \right)$$

In hospital h, the cost for patient ℓ in DRG g originating from initial cost center i is

$$Y_{i\ell gh} = \sum_k \left[\left(\gamma_{ikh} \right) \left(Y_{k\ell gh} \right) \right]$$

The costs for treating each patient by each initial cost center i may also be expressed in terms of labor equalized costs by

$$Y^e_{i\ell gh} = \left(\alpha_{ih} \right) \left(Y_{i\ell gh} \right)$$

Establishment of DRG Standard and Payment Rates

For each DRG, a standard rate will be established based on the equalized costs of treating all patients in the DRG across all hospitals. The standard rate for a DRG can be expressed as

$$z^e_g = f(U^e_{\ell gh}) \quad \text{For all } \ell \text{ in all h}$$

where z^e_g is the equalized standard rate for DRG g and U^e_{gh} is the equalized cost of patient ℓ in DRG g in hospital h and f is any function.

From the standard rate, an equalized payment rate for each individual hospital for each DRG is computed as a weighted linear combination of the hospital's DRG unit cost, U^e_{gh} and the standard equalized DRG rates, z^e_g.

$$Q^e_{gh} = f_g U^e_{gh} + (1 - f_g) z^e_g$$

where f_g is a coefficient for DRG g ranging from 0.0 to 1.0 and Q^e_{gh} is the equalized payment rate for DRG g in hospital h.

$$f_g = \frac{\left[\sum_h \sum_\ell (\bar{U}_g - U_{e\,gh})^2 / N\right]^{1/2}}{\bar{U}_g}$$

$$= \frac{(\text{Standard Deviation}_g)}{(\text{Mean}_g)}$$

when

$$(\text{Standard Deviation})_g < \text{Mean}_g$$

and

$$f_g = 1.0$$

if

$$(\text{Standard Deviation})_g \geq \text{Mean}_g.$$

where $\bar{U}_g = (\sum_h \sum_I U_{\ell gh})$

The standard deviation divided by the mean is called the coefficient of variation.

The equalized payment rate is unequalized to reflect a hospital's region's labor costliness by

$$Q_{gh} = (\beta_{gh})\ (Q^{e}_{gh})$$

where for hospital h, Q_{gh} is the unequalized, or actual, payment rate for DRG g.

A hospital's unequalized DRG payment rate can be adjusted to reflect anticipated inflation by

$$Q^{p}_{gh} = (\Delta_{gh})\ (Q_{gh})$$

It should be noted that Q^{p}_{gh} is calculated based upon the hospital's actual proportion of cost in each initial cost center for the DRG.

For the purposes of comparing a hospital's DRG cost performance against the standard rate at the initial cost center level, the fraction of the equalized standard rate associated with each initial cost center must first be calculated. These equalized standard rate fractions are calculated over all patients in all hospitals for the DRG. Multiplying each fraction against the standard rate provides an equalized standard initial cost center cost for the DRG.

$$z^{e}_{ig} = \left[\frac{\sum_{h} \hat{N}^{est}_{gh}\ U^{e}_{igh}}{\sum_{h} \hat{N}^{est}_{gh}\ U^{e}_{gh}} \right] z^{e}_{g}$$

or

$$z^{e}_{ig} = \left[\frac{\sum_{h} \sum_{\ell} Y^{e}_{\ell gh}}{\sum_{h} \sum_{i} \sum_{\ell} Y^{e}_{i\ell gh}} \right] z^{e}_{g}$$

where z^{e}_{ig} is the equalized standard unit cost of DRG g for initial cost center i. This is unequalized for each individual hospital by

$$z_{igh} = \beta_{ih} \; z^{e}_{ig}$$

And further, it can be adjusted for estimated inflation for each hospital by

$$z^{p}_{igh} = \Delta_{ih} \; z_{igh}$$

A. Mathematical Formulation of Overhead Allocation of Costs

$i \in$ set of m_1 accounts used for budgeting

$j \in$ set of m_2 patient groups

$k \in$ set of m_3 cost centers

f_{ik} = fraction of account i allocated to cost center k

$g_{ii'}$ = fraction of account i allocated to account i

We required $\sum_k f_{ik} + \sum_{i'} g_{ii'} = 1$ each i

p_{ik} = final fraction of account i allocated to cost center k

Calculation of p_{ik} and g_{ik} from f_{ik} and g_{ii}

Let F be the $m_1 \times m_3$ matrix (f_{ik})

G be the $m_1 \times m_1$ matrix (g_{ii})

I_3 be the $m_3 \times m_3$ identity matrix

$\emptyset$ be an $m_3 \times m_1$ matrix of zeros

Then the $(m_3 + m_1) \times (m_3 + m_1)$ matrix

$$B = \begin{pmatrix} I_3 & \emptyset \\ F & G \end{pmatrix}$$

gives the allocation profile from the $m_3 + m_1$ cost centers and accounts to themselves. If A^0 is the vector $(\underbrace{0,\ldots,0}_{m_3 \text{ times}},a_1,\ldots,a_{m_1})$

giving the initial levels of cost centers and accounts, then

$$A^1 = A^0 \; B$$

is a vector giving the levels of cost centers and accounts after one application of the allocation profile. If the last m_1 elements of A^1 were zero, then no further allocation would be necessary. In general however, these elements are non-zero and the allocation must be performed repeatedly to eliminate them. Thus we have

$$A^2 = A^1 \; B$$

$$A^3 = A^2 \; B$$

or

$$A^n = A^0 \; B^n$$

where B^n represents the multiplication of B by itself n times.

The requirement that

$$\sum_k f_{ik} + \sum_{i'} g_{ii'} = 1 \quad \text{each } i$$

makes A a Markov matrix. Further, a requirement that no set of accounts allocate only to themselves, i.e. there does <u>not</u> exist a subset of accounts $\mathcal{Z}$ for which

$$\sum_{i' \in \mathcal{Z}} g_{ii'} = 1 \qquad \forall_i \in \mathcal{Z}$$

insures that B is the matrix of an absorbing Markov process.

From the theory of Finite Markov Chains, (Kemeny and Snell, pp. 46 and 52) we have that

$$B^* = \lim_{n \to \infty} B^n$$

exists, that

$$A^* = A^0 B^*$$

is a vector with the last m_1 elements zero (meaning all amounts have been allocated to the cost centers), and

$$B^* = \begin{pmatrix} I_3 & \emptyset \\ P & \emptyset \end{pmatrix}$$

where the $m_1 \times m_3$ matrix $P = (p_{ik})$ is given by

$$P = (I_1 - G)^{-1} F$$

where I_1 is the $m_1 \times m_1$ identity matrix.

Given f_{ik} and $g_{ii'}$, the $p_{i\,k}$ can be found by solving the following set of simultaneous linear equations:

$$p_{ik} - \sum_i \left[\left(g_{ii'} \right) \left(p_{i'k} \right) \right] = f_{ik} \qquad \forall\ i, k \qquad (1)$$

In practice, account allocations are expressed in dollar amounts rather than normalized fractions, i.e. we are given

F_{ik} = dollars allocated from account i to cost center k

$G_{ii'}$ = dollars allocated from account i to account i'

and

$$\sum_{k} F_{ik} + \sum_{i'} G_{ii'} = T_i \qquad (1)$$

where

T_i = dollars in account i

We could compute

$$f_{ik} = F_{ik}/T_i$$

and

$$g_{ii} = G_{ii}/T_i$$

Instead we use these numbers directly by multiplying each equation in (1) by T_i and solving.

$$T_i\, p_{ik} - \sum_{i'} \left[\left(G_{ii'} \right) \left(p_{i'\, k} \right) \right] = F_{ik} \qquad \forall\ i,\ k$$

These constraints are sufficient to imply that

$$\sum_{k} p_{ik} = 1 \ .$$

B. Integerization Algorithm

Let r_k be the value of the kth element of a vector R of N non-negative real numbers. We define SR to be the rounded sum of all elements in vector R

$$SR = \left\lceil \sum_k r_k \right\rceil^1$$

where the symbols $\lceil\ \rceil$ represent the value rounded to the nearest integer and the symbols $\lfloor\ \rfloor$ represent the value truncated to the nearest integer.

The integerization algorithm will take the vector of non-negative real numbers R and their integerized sum SR and return a vector I of integer values i_k whose sum SI is equal to SR

$$\sum_k i_k = SI = SR$$

Define T to be the vector of integers resulting from the truncation of r_k values and t_k to be the kth element in vector T.

$$t_k = \lfloor r_k \rfloor$$

$\lfloor r_k \rfloor$ represents the largest integer less than or equal to r_k. Furthermore, define F, ST, and DS to be the following.

$$F = R - T$$

$$ST = \sum_k t_k$$

$$DS = SR - ST \qquad 0 \leq DS \leq N$$

where F is a vector of the fractional parts r_k which were truncated from the R vector, ST is the sum of R's integer values, and DS represents the sum of

[1] In some instances, SR may be adjusted to a value other than $\left\lceil \sum_k r_k \right\rceil$ to reflect special considerations.

R's fractional parts. If DS ≠ 0, than DS of the N_{tk} values in the T vector must be incremented by 1 so that

$$\sum_k t_k = ST = SR$$

The choice of t_k values to be incremented in T will be based upon the magnitude of the fractional part, $r_k - t_k$. A sorted vector, F* is determined by sorting the F vector from high to low. This results in the following:

$$\cdots f_{k-1} \geq f_k \geq f_{k+1} \geq f_{k+2} \cdots$$

Simultaneously, the cells in the T vector are interchanged in the same manner as the cells in the F vector. This means that when the sorting is completed, two new vectors, F* and T*, will exist.

F* is F ordered from high to low

T* is T ordered identically as F*

The first DS number of cells in the T* vector are incremented by 1 producing an I* vector.

$$I^* = \begin{cases} t_k + 1 & \text{for } k \leq DS \\ t_k & \text{for } k > DS \end{cases}$$

I* is then reordered to match the initial ordering of R. The reordered I* is I whose cell values are i_k. The vector I satisfies the requirement that

$$\sum_k i_k = SR$$

Example with N = 4 Cells

Cell	R	I	F
1	1.5	1	.5
2	2.6	2	.6
3	3.4	3	.4
4	4.8	4	.8
	12.3	10	

$SR = \lceil 12.3 \rceil = 12$

$ST = 10$

$DS = 12 - 10 = 12$

↓

Cell	F*	T*	I*
4	.8	4	5
2	.6	2	3
1	.5	1	1
3	.4	3	3

↓

Cell	I
1	1
2	3
3	3
4	5

$SI = 12 = SR$

APPENDIX B
FORMAT FOR SUBMISSION OF BILLS

Position	Datatype	Variable Name	Description	Valid Contents
1	i.1	hospnum	Puter hospital number	1-141
2	i.1	hosptyp	hospital type	1=NJUP 2=PAS 3=bill processor's 4=Independent
3	c.12	patnum	patient billing number	alpha-numeric
15	i.1	ayr	year of admission	70-77
16	i.1	amo	month of admission	1-12
17	i.1	ada	day of admission	1-31
18	i.1	dyr	year of discharge	76-77
19	i.1	dmo	month of discharge	1-12
20	i.3	dda	day of discharge	1-31
21	i.3	total	total ancillary charge	≥ 0
24	i.3	other	reserved for future use	zero filled
27	i.3	ans	anesthesiology charges	> 0
30	i.3	bbk	blood bank charges	> 0
33	i.3	css	central & sterile supply charges	> 0
36	i.3	del	delivery & labor room charges	> 0
39	i.3	dia	dialysis charges	> 0
42	i.3	edg	electro-diagnosis charges	> 0
45	i.3	lab	laboratory charges	> 0
48	i.3	nmd	nuclear medicine charges	> 0
51	i.3	orr	operating & recovery room charges	> 0
54	i.3	opm	other physical medicine charges	> 0
57	i.3	phm	pharmacy charges	> 0
60	i.3	pht	physical therapy charges	> 0
63	i.3	rad	radiology charges	> 0

Position	Datatype	Variable Name	Description	Valid Contents
66	i.3	rsp	respiratory therapy charges	> 0
69	i.3	tha	therapeutic radiology charges	> 0
72	i.3	cca	cardiac catherization charges	> 0
75	i.1	babyrec	on if baby bill	0 or 1
76	c.5	filler	reserved for future use	zero filled

Record Length 80 Blksize 8000 Date 7/20/77

	0	1	2	3	4	5	6	7	8	9
0	hospnum i.1	hosptyp i.1	patnum c.12							
1					ayr i.1	amo i.1	ada i.1	dyr i.1	dmo i.1	dda i.1
2		total i.3			other i.3		ANS i.3			
3	BBK i.3		CSS i.3			DEL i.3			DIA i.3	
4		EDG i.3			LAB i.3				NMD i.3	
5		ORR i.3			OPM i.3		PHM i.3			
6		PHT i.3		RAD i.3			RSP i.3		THA i.3	
7		CCA i.3			babyrec i.1		filler c.5			
8										
9										

BILLING MASTER (BL)

FIELD NAME	PICTURE	POSITION	CONTENTS and DESCRIPTION
BL-HEADER			
BL-REC-TYPE	X	0	(C) Record Type: 1 = Header 2 = Trailer
BL-HOSP-PAT-KEY			
BL-HOSP-CODE	X	1	(C) Hospital Code
BL-PT-NO	S9(11)	2-7	(P) Patient Number
BL-AR-PT-ACCT-NO	REDEFINES BL-PT-NO S9(11)		(P)
BL-REC-NO	X	8	(B) Record Number - initialized at 0 header record and increased by 1 for each trailer record
BL-KEY	REDEFINES BL-HOSP-PAT-KEY	X(8)	
BL-PT-NO=SCD	X	9	(C) Patient Number Self Check dig
BL-NO-CHGS	XX	10-11	(B) Number of transactions in thi record
BL-NO-CHG-BL	XX	12-13	UNUSED
BL-NO-CHG-INS	XX	14-15	UNUSED
BL-CD-NO	9	16	(C) Number to indicate which one the three prices in the charg master is to be charged to th patient - prices punched in t charge card override this parameter.
BL-GROUP-1			
BL-AR-NO	S9(11)	17-22	(P) Patient account number for AR will be the same as BL-PT-NO specified in profile record 1
BL-AR-NO-SCD	X	23	(C) Patient AR number self check c
BL-MED-REC	X(12)	24-35	(C) Medical record number
BL-MED-REC-SCD	X	36	(C) Medical record number self ch digit
BL-PT-NAME	X(25)	37-61	(C) Patient Name - Last Name, First Name and Middle Initial
BL-ADM-DATE			
BL-ADM-DATE-C	S9(4)	62-63	(B) Admission date - scalar format of expected date of admission preadmitted patients
BL-ADM-TIME	XX	64-65	(B) Time of admission - Military ti not used for preadmissions an outpatients
BL-DSCH-DATE			
BL-DSCH-DATE-C	S9(4)	66-67	(B) Discharge date - scalar format: HIGH VALUE = Patient not dis-charged LOW VALUE = Preadmitted pati
BL-DSCH-TIME	XX	68-69	(B) Time of discharge - military ti not used for outpatients
BL-TRF-AR	X	70	(C) Transfer to AR indicator:

FIELD NAME	PICTURE	POSITION	CONTENTS and DESCRIPTION
BL-CTSY-ALL	X	71	(C) Courtesy allowance-Hospital assigned
BL-BIRTH-DATE			
BL-BIRTH-DATE-C	S9(4)	72-73	(B) Birth Date-scalar format
BL-FC	X	74	(C) Financial Class
BL-MAR-SEX	X	75	(C) Sex and Marital Status Code Male / Female 0 Single 5 1 Married 6 2 Widowed 7 3 Separated 8 4 Divorced 9
BL-RACE	X	76	(C) Race Code-Hospital assigned
BL-RELIG	X	77	(B) Pointer to the hospital profi religion table
BL-CR-RATE	X	78	(C) Patient credit rating-hospita assigned
BL-DISTR	S9(3)	79-80	(P) District code-hospital assign
BL-HOSP-SERV	XXX	81-83	(C) Hospital service-External designation
BL-AD-DR-CODE	S9(5)	84-86	(P) Admitting Doctor Number
BL-AD-DR-NO-SCD	X	87	(C) Admitting Doctor Number Self Check digit
BL-AT-DR-CODE	S9(5)	88-90	(P) Attending Doctor Number
BL-AT-DR-NO-SCD	X	91	(C) Attending Doctor Self Check d
BL-PT-SS-NO			
BL-PT-SS-NO	S9(9)	92-96	(P) Patient Social Security Numbe
BL-PT-SS-ALF	XXX	97-99	(C) Medicare suffix, if any for Social Security Number
BL-GUAR-NO	S9(11)	100-105	(P) Guarantor Number
BL-GUAR-NAME-ADDR	X(65)	106-170	(C) Guarantor Name and Address (See subprogram DERGNAU for format)
BL-GUAR-TEL	S9(10)	171-176	(P) Guarantor telephone number
BL-PGM-IND	X	177	(B) Bit Indicators: 0 = Final diagnosis has been m when bit = 1 1 = Patient deceased when bit 2 = Late admission indicator-s by URMI, tested and reset BMU-indicates patient admi to the system one or more after being admitted to ho pital when bit = 1 3 = Baby blocks reserved in he record when bit = 1 4 = Patient admitted and disch same day when bit = 1 - se URMI, tested and reset by

LD NAME	PICTURE	POSITION	CONTENTS and DESCRIPTION
BL-PGM-IND (cont'd)	X	177	(B)Bit Indicators: 5 = Inpatients only-Patient has received a charge since las proration when bit = 1 - sc by BMU, tested and reset by CYCA 6 = Outpatients only-When speci outpatient processing is in dicated in profile 06 - Pro duce patient final bill whe bit = 1 7 = Outpatient only-When speci outpatient processing is in dicated in profile 06 - Fir insurance bill has been pr duced when bit = 1
BL-STMT-CODE	X	178	(C)AR Statement code
BL-LAST-PT-BL-DATE	XX	179-180	(B)Date plus 1 of last patient cycle bill-low-value if patie has not had a cycle bill - sc format
BL-LAST-INS-BL-DATE	XX	181-182	(B)Same as BL-LAST-PT-BL-DATE bu for Insurance cycle bill
-GROUP-2			
BL-CTRCT-AMT	S999V99	183-185	(P)Contract amount (See AI-CTRCT
BL-CTRCT-PER	X	186	(C)Contract period (See AI-CTRCT-I
L-GL-NO	S9(3)	187-188	(P)General ledger number for pati room charge-taken from Room Mas
BL-RM-SERV-CODE	XXX	189-191	(B)Service code for patients roon charge-taken from Room Master
BL-NO-BABY	S9	192	(P)Number of babies
BL-NUR-STA	X(4)	193-196	(C)Nurse station code for patient room and bed
BL-RM-BED-NO	X(6)	197-202	(C)Inpatients only-room and bed nu
BL-OP-LAST-ACTIVITY-DATE	REDEFINES BL-RM-BED-NO		
BL-LAST-ACTIVITY-DATE	XX	197-198	(B)Outpatients only-Date of last charge or admission date if pat has no charges-Scalar format
BL-OP-PAY-CD	X	199	(C)Outpatients only-When special outpatient processing is indi-cated in profile 06, will cont special case code from column of 11 card
BL-OP-REA-SER	XXX	200-202	(C)Same as BL-OP-PAY-CD but will contain Diagnosis code from columns 27-29 of 11 card.

LD NAME	PICTURE	POSITION	CONTENTS and DESCRIPTION
BL-PT-TYPE	X	203	(C)Patient accommodation type: Inpatients: P = Private S = Semi-private W = Ward I = Intensive Care A = Newborn (Mother in Hospital B = Newborn (Mother Discharged) J = Private Medically justified M = Minimal care Outpatients: E = Emergency C = Clinic D = Recurring R = Referred H = Home Health Care
BL-RM-RATE	S999V99	204-206	(P)Patients daily room change amo
L-DA-CHG-IND	X	207	(B)Daily charge indicators-Eight switches indicating which of th daily charge items are to be charged to the patient
L-INS-GROUP INS-COV OCCURS 4	TIMES		
L-INS-PLAN-ID BL-INS-CO-CODE	X	208	(C)Insurance Company Identificati
BL-INS-PLAN-NO	X	209	(B)Insurance Plan Number within company
BL-INS-POL-NO	X(11)	210-220	(C)Policy number
BL-INS-GR-NO	X(6)	221-226	(C)Group policy number
BL-INS-COV-KEY	X	227	(C)Insurance coverage code, used modify insurance master for th patient: S = standard policy coverage R = remaining policy coverage L = limited coverage M = maternity flat fee O = outpatient flat fee B = baby only coverage
BL-INS-DAYS-BL BL-INS-DAYS	S9(3)	228-229	(P)Days of insurance coverage remaining-only used when BL-IN COV-KEY is S, R or L
BL-INS-POL-LIM-BL BL-INS-POL-LIM	S9(5)	230-232	(P)Dollar amount of insurance coverage for the patient-only used when BL-INS-COV-KEY is S, or L
INS-DED-BL BL-INS-DED	S999V99	233-235	(P)Dollar amount of policy deduct to be paid by the patient-only used when BL-INS-COV-KEY is S, or L

BL-INS-RC-SEMI-BL			
BL-INS-RC-SEMI	S999V99	236-238	(P)Dollar limit for semi-private room charges or for Medicare plans the dollar portion of the field will contain lifeti reserve days
BL-INS-RC-RPIV-BL			
BL-INS-RC-PRIV	S999V99	239-241	(P)Dollar limit for private room charges or for Medicare plans the dollar portion of the fie will contain lapse till lifet reserve days
BL-BLOOD-DED	S9	242	(P)Medicare only-number of pints blood deductible
BL-INS-COB-FLAG	S9	243	(C)Insurance Coordination of Benefits indicator: 0 = no coordination 1 = coordination based on BL-INS-PRIORITY
BL-INS-PRIORITY	S9	244	(C)Coordination of benefits prio 0 = no coordination 1 thru 4 = sequence of priori
FILLER	XX	245-246	UNUSED
BL-NO-INS	S9	374	(P)Number of insurance plans
BL-SM-SB-RCD OCCURS 8 TIMES			Area to summarize patients daily charges as determined by BL-DA-C IND
L-SM-INS	X	375	(B)Insurance classification code
BL-SM-SERV-CODE	XXX	376-378	(B)Charge service code
BL-SM-PT-CYC-AMT	999V99	379-381	(P)Daily charge amount since las patient cycle bill or admissi if no bills produced
BL-SM INS-CYC-AMT	999V99	382-384	(P)Daily charge amount since las insurance cycle bill or admis
BL-SM-TOT-AMT	999V99	385-387	(P)Total daily charges as of las patient cycle bill (amount wi be 0 if no patient cycle bill produced)
BL-GROUP-3			
BL-AT-DR-NAME	X(25)	469-493	(C)Attending doctor name
BL-CHARACTER-INFO			
BL-ROUTING-CD	X	494	(C)Unused
BL-USER-CODES-WD			
BL-USER-CODE-WD	X(4) OCCURS 2 TIMES	495-498	(C)Unused
BL-AID-DAYS	99	503-504	(N)AID days
FILLER	X(6)	505-510	UNUSED
BL-CUR-DX-DSCR	X(20)	511-530	(C)
BL-DSCH-IND	X	531	(B)Bit Indicators: 0 = automatic outpatient discharge when Bit=1 2-7 = Unused
L-BILL-REQ	X	532	(C)Cycle bill request flag: A = Patinet & Insurance I = Insurance only P = Patient only
BL-CUR-DISP	X	533	(C) Disposition code
BL-CURR-CODES			
BL-CUR-DX-CODE	X(5) OCCURS 3 TIM		

FIELD NAME	PICTURE	POSITION	CONTENTS & DESCRIPTION
L-ACC-TYPE	X	549	(C)Accident Type - user defined, updated from 14 card
L-ACC-REL-CD	X	550	(C)Employment Related Accident Indicator - user defined - updated from 14 card
L-ACC-DATE	XX	551-552	(B)Accident Date - Scalar date format - updated from 14 card
-ONSET-CD	X	553	(C)Onset Code-user define updated from 14 card
L-SUBSCR-SEX	X	554	(C)Subscriber Sex - user defined - updated from 14 card
L-PAT-RELAT	X	555	(C)Patient Relationship to Subscriber - user defined - updated from 14 card
L-RESERVED-FOR-SHAS	X(44)	556-599	UNUSED

FIELD NAME	PICTURE	POSITION		CONTENTS and DESCRIPTION
-USER-AREA	X(20)	600-619		
TRANS-BLOCK				
L-DT-SB-RCD OCCURS	14 TIMES			Area in the header record accumul 14 transactions
BL-DT-INS	X	620 26C		(B)Insurance Classification code: 00-99 - Ancillary charge 124 - Disallow room charge 193-233- room charge 240 - Payment or Adjustment 241-244- Insurance payment or Adjustment
BL-DT-DATE	XX	621-622	2	(B)Transaction date-scalar format
BL-DT-AMT	S999V99	623-625	3	(P)Transaction amount(if charge contains a professional fee, it will not be included in this amount)
BL-DT-PRO-FEE	S999V99	626-628	3	(P)Professional fee amount
BL-DT-SERV-CODE	XXX	629-631	3	(B)Charge service code
BL-DT-IND	X	632	1	(B)Bit Indicators: 0-3 = charge quantity 4 = charge has appeared on a previous patient cycle b when bit=1 5 = blood replacement charge when bit=1 6 = charge has appeared on a previous insurance cycle when bit=1 7 = baby charge when bit=1
ROOM-BLOCK REDEFINES BL-TRANS-BLOCK				
L-RC-SB-RCD OCCURS	14 TIMES			Room charge record format
BL-RC-PT-TYPE	X	620		(B)Insurance classification code: 193-233 - Room charge (patient type)
BL-RC-DATE	XX	621-622		(B)Date of room charge-scalar for
BL-RC-AMT	S999V99	623-625		(P)Room charge amount
BL-RC-IND	X	626		(B)Bit indicators: 0-3 = unused 4 = charge has appeared on a previous patient cycle b when bit=1 5 = unused 6 = charge has appeared on a previous insurance cycle bill when bit=1 7 = unused

FIELD NAME	PICTURE	POSITION		CONTENTS and DESCRIPTION
FILLER	XX	627-628		UNUSED
BL-RC-RM-NO	X(4)	629-632		(C)Room number
BL-BBY-BLOCK REDEFINES BL-PRO-BLOCK				
BL-BBY-SB-RCD OCCURS 3 TIMES				Area in header record reserved ofr baby information for patients admitted to obstetrics service
BL-BBY-NAME	X(23)	620-642	23	(C)Baby name
BL-BBY-BIRTH-DATE	XX	643-644	2	(B)Baby birth date-scalar format
BL-BBY-MAR-SEX	X	645	1	(C)Baby sex (see BL-MAR-SEX)
BL-BBY-AT-DR-CODE	S9(5)	646-648	3	(P)Attending doctor number
BL-BBY-DR-CODE-SCD	X	649	1	(C)Attending doctor number self check digit
BL-BBY-PGM-IND	X	650	1	(B)Bit indicators-bits 3, 5, 6 a 7 are unused others have the same meaning as BL-PGM-IND
BL-BBY-GL-NO	S999	651-652	2	(P)General ledger number for babies room charge
BL-BBY-RM-SERV-CODE	XXX	653-655	3	(B)Service code for babies room charge
BL-BBY-NUR-STA	X(4)	656-659	4	(C)Nurse station code for babies room
BL-BBY-RM-BED-NO	X(6)	660-665	6	(C)Babies room & bed number
BL-BBY-PT-TYPE	X	666	1	(C)Babies patient type-always 'A
BL-BBY-RM-RATE	S999V99	667-669	3	(P)Babies daily room charge amou
BL-BBY-DSCH-DATE	XX	670-671	2	(B)Baby discharge date-scalar fo HIGH-VALUE if baby inhouse
FILLER	X(26)	776-801	52	

BILLING MASTER (BL) (cont'd)

FIELD NAME	PICTURE	~~POSITION~~		CONTENTS and DESCRIPTION
L-DETAIL (REDEFINES BL-HEADER)				
L-REC-TYPE-D	X	0		(C) Record Type (See BL-REC-TYPE)
L-KEY-D				
BL-HOSP-CODE-D	X	1		(C) Hospital code
BL-PT-NO-D	S9(11)	2-7		(P) Patient Number
BL-REC-NO-D	X	8		(B) Record Number (See BL-REC-NO)
BL-NO-CHGS-D	XX	9-10		(B) Number of transactions in this record
BL-NO-CHG-BL-D	XX	11-12		UNUSED
BL-NO-CHG-INS-D	XX	13-14		Unused
FILLER	X(7)	15-21		Unused
L-TRANS-BLOCK-D				
BL-DT-SB-RCD-D occurs 60 times				
BL-DT-INS-D	X	22	1	(B) Insurance Classification code (See BL-DT-INS)
BL-DT-DATE-D	X	23-24	2	(B) Transaction date-scalar forma
BL-DT-AMT-D	999V99	25-27	3	(P) Transaction amount - (See BL-DT-AMT)
BL-DT-PRO-FEE-D	999V99	28-30	3	(P) Professional fee amount - (See BL-DT-PRO-FEE)
L-DT-SERV-CODE-D	XXX	31-33	3	(B) Charge service code
BL-DT-IND	X	34	1	(B) Bit Indicators - (See BL-DT-IN

APPENDIX C
INSITUTIONAL COST VARIABLES

1. Independent Variables for Institutional Costs Analysis

a. General Hospital Characteristics

Three factors were used to estimate the progressive impact on institutional costs due to the maintenance of the sheer size of facility, namely total plant square feet and the number of licensed beds, both of which were obtained from SHARE 1976 actual reports. The number of acres of total property owned by the hospital was obtained from the tax exempt property rolls at the State Department of Transportation. The property data was for either 1973, 1974, or 1975 depending on the municipality.

Other characteristics indicative of the size of the institution and its patient load were the total number of patient admissions and the total patient care costs. Both items were obtained from SHARE 1976 actual reports.

b. Hospital Teaching Commitment

Size of the teaching program was used as a proxy for the degree of teaching commitment of the institution. Both graduate medical education, and nursing and allied health programs were reviewed. Two measures were used for graduate medical programs, the number of house staff positions offered and the number of approved residency programs listed in the AMA Approved Residency Program guidebook for 1976. The size of other educational programs was measured by the total number of student hours per year per hospital without differentiating between skill levels or cost for each program.[1]

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[1]Student hours were calculated from data recorded in "An Inventory of Clinical Resources Used by Health Professions Education Programs in New Jersey", NJ Department of Higher Education, July 1976.

c. Hospital Location Population Demographics

Several different measures were used to identify the effect of the locality on institutional costs. In order to estimate degrees of urbanization, the total population for the SMSA,[2] for the county,[3] and the population density by municipality[4] were each tested. The most recent population data available was for 1975 and 1976. The median household earnings for the population in the institution's immediate census tract[5] (1974 estimate) became a measure of the possible impact of a community's relative wealth on the hospital's costs.

The ratio of Medicaid admissions to total patient admissions[6] was considered as a measure of possible increased costs due to the institution's physical location in an extremely poor community.

d. Hospital Geography

In addition to examining the urban/rural setting, the consequences of other geographic measures were examined. The distance[7] from the center of the New York City and Philadelphia Consolidated Statistical Metropolitan Areas were used to view any residual cost differentials of these controlling markets once labor dollars were equalized.

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[2]SMSAs are Standard Metropolitan Statistical Areas delineated by the Bureau of Labor and Statistics.

[3]County population data were obtained for 1976 from each county planning board.

[4]Data derived from "Division of State and Regional Planning: NJ Municipality Profiles Intensity of Urbanization" from the Department of Transportation, 1976.

[5]Data obtained from Census Tract Statistics compiled by Bureau of Labor and Statistics.

[6]SHARE 1976 Actual reports.

[7]Mileage calculated from plan or map coordinates compiled by the Department of Transportation.

2. Variables Used in Establishment of Regression Equation

LIST OF PREDICTED VALUES, RESIDUALS, AND VARIABLES
(- INDICATES A CASE CONTAINING ONE OR MORE VARIABLES OUT OF RANGE OR MISSING)

CASE NO.	LABEL	PREDICTED	RESIDUAL	WEIGHT	VARIABLES 2 TOTLA	1 HOSPNM	3 TOTPOP	4 TSTAF	5 CIPPCT	6 TCIP
1		5535.9219	277.9688	1.000	5813.8906	1.0000	15598.2031	61.2000	0.9400	57.5280
2		7182.2383	-654.2969*	1.000	6527.9414	2.0000	17973.5820	124.7000	0.8800	109.7359
3		1625.7229	376.5229	1.000	2002.2458	3.0000	5303.4609	0.0	0.0	0.0
4		631.9355	23.8584	1.000	655.7939	4.0000	1663.5957	0.0	0.0	0.0
5		2111.6748	284.0808	1.000	2395.7556	5.0000	5264.0039	32.9000	0.7900	25.9910
6		1800.9189	-58.6123	1.000	1742.3066	6.0000	5945.1367	0.0	0.0	0.0
7		2974.7190	-881.6763**	1.000	2093.0427	8.0000	10244.3203	0.0	0.0	0.0
8		4026.4272	31.3232	1.000	4057.7505	9.0000	14096.3281	0.0	0.0	0.0
9		2411.5291	288.2466	1.000	2699.7756	10.0000	7152.6016	14.7000	1.0000	14.7000
10		1316.0093	18.7986	1.000	1334.8079	11.0000	4169.0977	0.0	0.0	0.0
11		3486.9463	-170.9907	1.000	3315.9556	12.0000	12120.4141	0.0	0.0	0.0
12		1441.4778	-246.7920	1.000	1194.6858	13.0000	4626.6406	0.0	0.0	0.0
13		5213.3125	-212.8789	1.000	5000.4336	14.0000	15325.7461	52.4000	0.8500	44.5400
14		5567.1797	-168.2578	1.000	5398.9219	15.0000	15931.6445	64.0000	0.8500	54.4000
15		3026.3989	53.9358	1.000	3080.3347	16.0000	10110.2148	6.0000	0.7700	4.6200
16		1969.7498	-137.9919	1.000	1831.7578	17.0000	6563.5000	0.0	0.0	0.0
17		1711.6860	-72.5103	1.000	1639.3757	18.0000	5619.0430	0.0	0.0	0.0
18		5187.9883	1235.2031**	1.000	6423.1914	19.0000	14778.6992	63.0000	0.8100	51.0300
19		1749.7144	-31.2136	1.000	1718.5007	20.0000	5757.5938	0.0	0.0	0.0
20		4402.0547	-734.7100*	1.000	3667.3447	21.0000	12790.1484	39.5000	0.9700	38.3150
21		4620.0469	1212.7695**	1.000	5832.8164	22.0000	16270.5313	0.0	0.0	0.0
22		373.2141	-182.4151	1.000	190.7990	23.0000	715.9968	0.0	0.0	0.0
23		2036.7954	-141.9766	1.000	1894.8188	24.0000	6809.0625	0.0	0.0	0.0
24		2226.4373	-300.6526	1.000	1925.7847	25.0000	7503.6484	0.0	0.0	0.0
25		2349.6038	431.3699*	1.000	2780.9736	26.0000	7814.7656	2.0000	1.0000	2.0000
26		2669.4507	680.4460*	1.000	3349.8967	27.0000	9126.2383	0.0	0.0	0.0
27		1265.7771	-2.7534	1.000	1263.0237	28.0000	3985.1157	0.0	0.0	0.0
28		3143.0696	-247.8540	1.000	2895.2156	29.0000	10732.1289	2.0000	0.9200	1.8400
29		1424.7405	77.8123	1.000	1502.5527	31.0000	4528.8398	1.0000	0.5500	0.5500
30		1239.7371	-243.1553	1.000	996.5818	32.0000	3889.7407	0.0	0.0	0.0
31		1899.8342	681.9045*	1.000	2581.7388	33.0000	6307.4258	0.0	0.0	0.0
32		3877.0657	-772.8491*	1.000	3104.2166	34.0000	13549.2734	0.0	0.0	0.0
33		1866.6073	-291.5686	1.000	1574.4387	35.0000	6183.5313	0.0	0.0	0.0
34		885.5576	320.2651	1.000	1205.8228	36.0000	2592.5166	0.0	0.0	0.0
35		2209.3142	-451.6445*	1.000	1757.6697	37.0000	7440.9336	0.0	0.0	0.0
36		3202.2422	-222.6235	1.000	2979.6187	38.0000	9145.7109	30.0000	0.9200	27.6000
37		4462.6641	265.7891	1.000	4728.4531	39.0000	13498.9766	32.0000	0.9800	31.3600
38		2993.7881	492.0315*	1.000	3485.8196	40.0000	9598.7852	14.0000	0.7300	10.2200
39		2437.3977	-617.3279*	1.000	1820.0698	41.0000	8276.3164	0.0	0.0	0.0
40		1439.8396	-327.3708	1.000	1112.4688	42.0000	4622.6406	0.0	0.0	0.0
41		1091.6006	-255.5317	1.000	836.0688	43.0000	3347.1736	0.0	0.0	0.0
42		2398.7886	250.5762	1.000	2649.3647	44.0000	8134.9063	0.0	0.0	0.0
43		4992.5859	-150.8008	1.000	4841.7852	45.0000	15283.0938	40.0000	0.8400	33.6000
44		2327.8193	-676.1516*	1.000	1651.6677	47.0000	7320.5898	8.0000	0.9900	7.9200
45		2862.7747	-310.6519	1.000	2552.1228	48.0000	9074.4844	16.7000	0.6500	10.8550
46		2207.0222	89.4585	1.000	2296.4807	49.0000	7432.5391	0.0	0.0	0.0
47		2062.9390	60.4087	1.000	2123.3477	50.0000	6904.8164	0.0	0.0	0.0
48		5772.3984	50.4375	1.000	5822.8359	51.0000	16179.2969	70.0000	0.8800	61.6000
49		2462.4202	-494.6614*	1.000	1967.7588	52.0000	8367.9648	0.0	0.0	0.0
50		1161.7024	-81.2805	1.000	1080.4219	53.0000	3603.9297	0.0	0.0	0.0
51		3856.8792	-13.5645	1.000	3843.3147	54.0000	13174.3477	4.3000	1.0000	4.3000
52		847.5435	-92.4565	1.000	755.0869	56.0000	2453.2847	0.0	0.0	0.0
53		3441.7878	-424.4592	1.000	3017.3286	57.0000	10691.6953	18.8000	0.9600	18.0480
54		371.7861	-30.9683	1.000	340.8179	59.0000	710.7668	0.0	0.0	0.0
55		2220.9937	206.5142	1.000	2427.5078	61.0000	7483.7109	0.0	0.0	0.0
56		5039.2656	355.9805	1.000	5395.2461	62.0000	13699.0547	77.2000	0.7600	58.6720

57	4711.8516	466.2578*	1.000	5178.1094	63.0000	13095.6875	57.0000	0.8800	50.1600
58	4427.3672	-89.2617	1.000	4338.1055	64.0000	12540.9219	54.0000	0.8000	43.2000
59	741.3940	91.3198	1.000	832.7139	65.0000	2064.4998	0.0	0.0	0.0
60	2820.3064	-437.4458*	1.000	2382.8606	67.0000	9678.7656	0.0	0.0	0.0
61	1291.7222	-323.8054	1.000	967.9167	68.0000	4080.1426	0.0	0.0	0.0
62	4196.4492	-144.4365	1.000	4052.0127	70.0000	13172.1133	26.0000	0.8500	22.1000
63	1891.0962	-381.3674	1.000	1509.7288	71.0000	6275.4219	0.0	0.0	0.0
64	3075.0488	911.4297**	1.000	3986.4785	72.0000	8864.0445	26.0000	0.9600	24.9600
65	3658.0061	321.8755	1.000	3979.8816	73.0000	11652.1758	17.0000	0.9200	15.6400
66	6927.6406	-65.4141	1.000	6862.2266	74.0000	18255.0039	106.2000	0.8700	92.3940
67	6253.2734	564.0391*	1.000	6817.3125	75.0000	16446.1172	105.0000	0.7900	82.9500
68	8599.0703	-550.7773*	1.000	8048.2930	76.0000	25493.5625	78.0000	0.9800	76.4400
69	2298.7375	-371.2288	1.000	1927.5088	77.0000	7768.4570	0.0	0.0	0.0
70	3340.8669	64.6306	1.000	3405.4976	78.0000	11183.5938	7.0000	0.8200	5.7400
71	1982.5171	1210.0586**	1.000	3192.5757	80.0000	6610.2617	0.0	0.0	0.0
72	2649.0129	-578.2163*	1.000	2070.7966	81.0000	9051.3828	0.0	0.0	0.0
74	1895.7290	782.6138*	1.000	2678.3428	83.0000	6292.3906	0.0	0.0	0.0
75	1875.4419	-275.4941	1.000	1599.9478	84.0000	6218.0859	0.0	0.0	0.0
76	1243.8923	263.9375	1.000	1507.8298	85.0000	3904.9607	0.0	0.0	0.0
77	2018.3552	81.4724	1.000	2099.8276	86.0000	6741.5234	0.0	0.0	0.0
78	1758.3508	-306.4102	1.000	1451.9407	87.0000	5789.2266	0.0	0.0	0.0
79	1071.4539	-312.1621	1.000	759.2917	88.0000	3273.3835	0.0	0.0	0.0
80	532.2783	205.5376	1.000	737.8159	89.0000	1298.5889	0.0	0.0	0.0
81	1531.7639	168.0508	1.000	1699.8147	90.0000	4959.3242	0.0	0.0	0.0
82	1272.7903	-206.2415	1.000	1066.5488	91.0000	4010.8025	0.0	0.0	0.0
83	3267.5388	-136.0891	1.000	3131.4497	92.0000	9737.0563	24.0000	0.9400	22.5600
84	1696.5142	17.8025	1.000	1714.3167	93.0000	5562.7422	0.0	0.0	0.0
85	739.3508	45.7449	1.000	785.0957	94.0000	2057.0168	0.0	0.0	0.0
86	5483.0742	-297.8672	1.000	5185.2070	96.0000	13236.3828	96.2000	0.9200	88.5039
87	976.2473	3.9094	1.000	980.1567	100.0000	2924.6787	0.0	0.0	0.0
88	915.4602	-140.0435	1.000	775.4167	105.0000	2702.0386	0.0	0.0	0.0
89	2275.2378	163.9949	1.000	2439.2327	106.0000	6044.4375	23.4000	1.0000	23.4000
90	3227.2129	798.1697*	1.000	4025.3826	108.0000	11169.1094	0.0	0.0	0.0
91	1110.1782	98.2126	1.000	1208.3909	110.0000	3415.2166	0.0	0.0	0.0
92	1386.1138	-312.4890	1.000	1073.6248	111.0000	4425.6633	0.0	0.0	0.0
93	1382.3245	-130.7188	1.000	1251.6057	112.0000	4411.9844	0.0	0.0	0.0
94	1140.3853	728.7715*	1.000	1869.1567	114.0000	3525.8535	0.0	0.0	0.0
95	943.7671	-204.9792	1.000	738.7878	115.0000	2805.7156	0.0	0.0	0.0
96	1657.9585	211.8262	1.000	1869.7847	117.0000	5421.5273	0.0	0.0	0.0

EACH ASTERISK REPRESENTS ONE STANDARD DEVIATION

TCIP = inpatient equivalent of residents
CIPPCT = inpatient ratio for RSD cost center
TSTAF = number of resident positions available for 1976
TOTPC = 1976 patient care costs
TOTICA = 1976 institutional costs
Predicted = predicted value for institutional budget used to examine closeness of fit of regression equation

APPENDIX D
COSTING DIFFERENCES

State of New Jersey
DEPARTMENT OF HEALTH
JOHN FITCH PLAZA
P.O. BOX 1540, TRENTON, N.J. 08625

JOANNE E. FINLEY, M.D., M.P.H.
COMMISSIONER

FROM: Joseph I. Morris, Rate-Setting Coordinator

SUBJECT: Costing Differences

The following data is considered to be necessary for satisfactory documentation of your costing difference requested in your 1978 SHARE Budget Submission.

1. NJ Blue Cross Schedule I and the supporting schedules.

2. The cost allocation worksheets. The Medicare "Stepdown" forms, form 2552, worksheets B and B-1, are acceptable. If an alternate cost allocation methodology is used, please send evidence of NJ Blue Cross acceptance of that method along with the methodology worksheets.

3. The RCCAC worksheet which allocated the costs to inpatient, EMR, etc.

The costs to be run through the above allocation should be the 1978 Budgeted cost.

The cost differential considered valid will be a comparison of SHARE CIP cost (Line F) and the N.J.B.C. CIP equivalent; Schedule I, Line H minus the Rider J cost if necessary. Comparisons between isolated, partial components, such as emergency room cost, will be unsatisfactory because the effect of all areas of potential cost allocation variances, those favorable as well as unfavorable to the SHARE System, must be considered in evaluating the costing difference.

Upon receipt of this information, your Analyst will reconsider your costing difference request in the 1978 Budget for inclusion in your next regular rate adjustment.

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